A CENSUS OF THE ENDOPARASITES RECORDED AS OCCURRING IN QUEENSLAND, ARRANGED UNDER THEIR HOSTS.

By T. Harvey Johnston, M.A., D.Sc., F.L.S.

Walter and Eliza Hall Fellow in Economic Biology in the University of Queensland.

(*Read before the Royal Society of Queensland, 27th March, 1916*).

This paper is offered as the second and more specialised portion of my presidential address (1916*b*). It is an attempt to bring together, for the first time, a list of all the internal parasites recorded definitely from Queensland, whether protozoon or helminth*. All records which are not explicit are omitted, *e.g.*, those made by Krefft in 1871, who mentioned that the forms recorded by him, except a few which were more or less localised, were collected in New South Wales or Queensland.

With the exception of Wolffhügel's† catalogue of the parasites of Argentina and Hall's‡ list of those occurring

---

*I have also included members of those genera of Arthropoda which are generally grouped amongst the helminths, *e.g.*, the Linguatulida and the larvae of the botflies, *Oestrus, Gastrophilus*, etc. There are, however, many other internal parasites belonging to the phylum, as for example, Copepods and Isopods infesting the gills and buccal cavity of our marine fishes, *Sacculina* in crabs (Port Curtis), Copepods in the mantle cavity of certain Gastropods, *Ascidiicola* sp. in the pharynx ot *Cynthia præputialis*, *Unionicola* sp. (a mite) in the gills of our freshwater mussels, etc.

†K. Wolffhügel. Los Zooparasitos de los animales domesticos en la Republica Argentina. Rev. Centr. Estud. Agronom. y. Veterin. 1910-11, Buenos Aires.

‡M. Hall. The parasitic fauna of Colorado. Colorado College Publications, Science Series, xii., No. 10, 1912, pp. 329-384.

in Colorado, I do not know of any attempt to list the recorded protozoon as well as helminth endoparasitic fauna of any country. Queensland occupies a large tract of country, larger than many of the European countries taken together, and possesses a vast fauna on land and in its waters, the greater part of which is as yet unsearched for entozoa. This is particularly the case with regard to our fish, reptiles and invertebrates. Even the domesticated animals have not yet been systematically examined. In spite of these facts, the entozoa of Queensland and New South Wales have received much more attention than those of the other Australian States.

In 1909, Dr. G. Sweet published her census of the endoparasites of the native fauna and domesticated animals in Australia (1908), but the protozoa, of which very few were then known, were not included. The number of hosts in Queensland from which worms were definitely there recorded, is considerably less than 40—nearer 30, and of these about one-third were birds in which Dr. T. L. Bancroft (1890*a*) found filariæ. Since that time, several workers have been engaged in the work and the number of Queensland hosts from which parasites are recorded, is now about 180. From many of them, however, only hæmoprotozoa have been as yet reported. This list comprises about 30 mammals, nearly 90 birds, nearly 30 reptiles, 6 frogs, 18 fish, and about a dozen arthropods. Our molluscs have not yet been searched.

Dr. Sweet's list contains the names of about 80 native and about 15 introduced hosts in Australia recorded as harbouring endoparasites. This is mentioned merely to emphasise the advance which has been made in the past seven years, the chief workers in Queensland parasitology being W. Nicoll, A. Breinl, S. J. Johnston, J B Cleland and T. H. Johnston, the two last-named being indebted especially to Dr. T. L. Bancroft for abundant material, much of which still awaits investigation.

A list of the parasites recorded from man and the domesticated animals in Australia was published some years ago (Johnston, 1910*b*). I have also given a census of Australian avian* and reptilian entozoa in 1910 and 1911, respectively, and of the parasites from marsupials and monotremes in 1909 (1909*e*) and 1911 (1911*a*). In other papers (Johnston, 1909*c*, 1910*d*; Johnston and Cleland, 1912*a*; Cleland and Johnston, 1912*d*), there have been collected a large number of records, particularly those relating to the entozoa of man.

The Australian hæmatozoa, especially those of birds and reptiles, have received considerable attention from Cleland and myself (Cleland and Johnston, 1912*b*, etc.), though other workers, particularly Breinl (1913), have also interested themselves. S. J. Johnston and W. Nicoll have added greatly to our knowledge of the trematode fauna of Eastern Australia, and have worked on material from North Queensland. I have concerned myself with the Cestodes especially and to a less extent with the Nematoda. The lastnamed group has been studied also by Dr. G. Sweet.

MAMMALIA.

a denotes a protozoon; *b*, a trematode; *c*, a cestode; *d*, a nematode including echinorhynch; *e*, an arthropod.

PRIMATES.

Homo sapiens L. (Man).

Amongst the *Chlamydozoa*, if the "cell inclusions" be Protozoon parasites, are the organisms causing

- *chickenpox, varicella, vaccinia* (Guarnieri's bodies, *Cytoryctes vacciniæ*);
- *variola, smallpox* (*Cytoryctes variolæ*, Guarn.);
- *scarlet fever* (*Cyclasterion scarlatinalis*, Mallory, or *Cytoryctes scarlatinæ*, Siegel—Mallory's bodies).
- *trachoma* (Prowazek's bodies);
- *cancer* (the parasitic nature of which is still a debatable matter).
- *dengue*—apparently a mosquito-borne disease, and probably due to an ultra-microscopic protozoon.
- *measles, whooping cough, cerebrospinal meningitis* and *mumps* which are perhaps caused by unknown protozoa.

---

*A later list of entozoa recorded from Australian birds was published in *The Emu*, Oct., 1912 (Johnston, 1912*c*.)

No attempt has been made to collect references to the occurrence of these diseases in Queensland, though in Johnston, 1909*c*, those relating to dengue and smallpox are quoted, whilst Cleland (1913) has given an account of the occurrence of whooping cough, measles and scarlet fever—also (1914*c*) of dengue in Australia; and Breinl (1913*e*) (dengue and smallpox)—see also Moore, 1914; O'Brien, 1908; Turner, 1890; Davidson and Scott, A. Med. Gaz., 1911.*

Amongst the *Proflagellata* (*Spirochætida*) there may be mentioned

Treponema pallidum, Schaud (syphilis).

Treponema pertenue, Castell (yaws)—Torres Straits chiefly. Brienl, 1915; Elkington, 1912.

Many of the earlier references will be found in Johnston, 1909*c*.

The disease of *ulcerating granuloma* (*granuloma pudendi* or *granuloma inguinale*) occurs amongst the aboriginal population in the North (O'Brien, 1908; Jackson, 1911; McLean, 1911; Elkington, 1912; Brienl and Priestley, 1916*b*). Its causative organism may be *Spirochæta aboriginalis*, Cleland, or it may (more probably) be caused by *Leishmania* sp.†, which is found infecting some of the cells.

Amongst the Sarcodina, the only one recorded is *Entamœba histolytica*, Sch., which causes amœbic dysentery and tropical liver abscess.

For references see Johnston 1909*c*; O'Brien (A. Med. Gaz., 18, 1899). It is endemic in New Guinea (Breinl 1913*e*, Moore, 1914), Thursday Island and other islets in Torres Straits (Elkington, 1911, 1912, 1912*b*; Breinl, 1911, 1915, 1913*e*). *Entamoeba coli*, Loesch, is no doubt common, but I do not know of any record of its presence in this State.

---

*H. L. Cumpston, The History of Smallpox in Australia. Govt. Printer, Melbourne, 1914.

†Cleland, Trans. Austr. Inter. Med. Congr., ix., 1911 (1913), 1, pp. 522-4; Strangman, *Id.*, pp. 518-522; Carter, Lancet, 15th Oct., 1910, p. 1128. See also Castellani and Chalmers, Man. Trop. Med., Ed. 2, 1913, p. 1571: Strangman, A. Med. Gaz., 1911, p. 76; p. 446; Breinl and Priestley, 1916*b*.

All three forms of malaria are known from Queensland, viz., tertian or benign tertian (*Plasmodium vivax*, Gr. and Fel.), quartan (*P. malariæ*, Lav.), and intermittent or malignant tertian fever (*P. falciparum*, Lemaire). The last has been introduced, chiefly by miners, from New Guinea, where it is endemic (Breinl; Elkington; Booth-Clarkson; Moore, 1914*).

For references see Johnston, 1909*c*; Cleland, 1914*c*; Turner, 1890; Breinl, 1912, 1913*e*, 1915; O'Brien, 1908; Butler, 1912; Elkington, 1910, 1912, 1912*c*; Breinl and Priestley, 1916*a*.

All three types occur in districts of North Queensland, some of them being now endemic (*e.g.*, *P. vivax*—in Cairns [Moore, 1914], and Port Douglas.†).

O'Brien (1908), states that the type is almost always tertian, and only occasionally is quartan or malignant malaria met with in Northern Queensland.

No trematode parasites have been recorded as far as I know, though a number of cases of Schistosomiasis occurred in Queensland, amongst men who had become infected by *Schistosomum hæmatobium*, Bilh., during the South African (Boer) War.

Two Cestodes have been reported.

Tænia saginata, G., Jnstn., 1910*b*; 1910*f* (Brisbane), Nicoll, 1914*d* (N.Q.)—apparently uncommon in this State.

Echinococcus granulosus, B. (the hydatid stage, more commonly known as *Echinococcus hominis* or *E. veterinorum*, R.). For references see Johnston, 1909*c*; rare in N.Q. (Nicoll, 1914*d*);

---

*R. F. Jones gave an account of the "Diseases of British New Guinea" (Tr. Soc. Trop. Med. Hyg., January, 1911; Abstr. in A. Med. Gaz., June, 1911, p. 356). Amongst those met with were malaria, both simple tertian and æstivo-autumnal; amœbic dysentery and liver abscess; *Filaria bancrofti*; ulcerating granuloma; and dengue (imported); while Ankylostomiasis was encountered only in that part which was then known as German New Guinea.

†See Brisbane *Courier* of May 27, 1916, p. 6, regarding the presence of Malaria in Cairns and Port Douglas (Q.) and Overland Corner (S. Australia).

Turner, 1890; Cleland, 1912*b*; Elkington, 1912*c*; Cameron, Turner and Gibson (A.M.G., 34, 1913, p. 436).

Many nematodes have been recorded from man in Queensland.

Ascaris lumbricoides, L.. Flynn, 1901; Jnstn., 1910*b* (Brisbane); Nicoll, 1914*d*., N.Q.—uncommon.

Oxyuris vermicularis, Linn., Jnstn., 1910*b*; 1910*f* (Brisbane); Nicoll, 1914*d* (N.Q.)

Trichinella spiralis, Owen., Halford, 1898.

Trichuris trichiura, L. (*Trichocephalus dispar*, Rud.), Hogg, 1889*a*; Bacot, 1892 (N.Q.); Bancroft, 1893*c* (Brisbane); Lawes, 1895; Jnstn., 1909*c*, 1910*b*; J. and C., 1912*a*; Nicoll, 1914*d*.

Strongyloides intestinalis, Bavay (*Rhabdonema stercoralis*, Bav.); Ashworth, 1896; J. and C., 1912*a*; Breinl, 1913*d*; Nicoll, 1914*d* (N.Q.).

*Ancylostoma** *duodenale*, Dub. (*Anchylostoma*, *Ankylostoma*)—the commoner hook worm.

For summary of references see Jnstn., 1909*c*, and Jnstn. and Clel, 1912*a*; Hogg, 1889*b*, *c* (Goodna); Bacot, 1892 (N.Q.); Gibson, 1892 (Maryborough), 1895; Gibson and Turner, 1892 (N.Q.); T. L. Bancroft, 1893*c*, 1893*d*, 1902; Turner, 1895 (Brisbane) 1896, 1909; Love, 1895; Ashworth, 1895, 1896; Lawes, 1895; Hardie, 1897 (Cairns); O'Doherty, 1898; Hamilton-Kenny, 1906 (Gympie); Macdonald, 1908 (N.Q.); O'Brien, 1908 (N.Q.); Salter, 1909 (Brisbane); Leiper, 1908; Halford, Gibson, Robertson, 1909; Breinl, 1913*e*, 1913*f*, 1913*d* (N.Q.); Macdonald (in Breinl, 1913*e*)—Gulf Country; Nicoll, 1914*d* (N.Q.); Breinl, 1911, 1915; Ham, 1909; Booth-Clarkson, 1913; Salter, 1911; Croll, 1911; Elkington, 1910, 1911, 1911*b*, 1912, 1912*c*; W. Macdonald, 1911; Cameron, 1913.

---

*This spelling of the name has been recently (1916) adopted by the International Commission on Zoological Nomenclature.

Necator americanus, Stiles (a hook worm). Leiper, 1908, from Bancroft; Breinl, 1913*d*, 1915 (N.Q. and New Guinea); Nicoll, 1914*d* (N.Q.); W. Macdonald, 1911.

Filaria bancrofti, Cobbold, the larva of which inhabits the blood, and is known as *Microfilaria nocturna*, Manson, or *M. sanguinis hominis*, Lewis.

For summary see Johnston, 1909*c* and Jnstn. and Clel., 1912*a*; Cobbold, 1876*a*, 1876*b*, 1877, 1879*a*, 1879*b*; J. Bancroft, 1876, 1878, 1879, 1882*a*, 1882*b*, 1889, 1892; Love, 1889; Turner, 1890; Hoggan, 1892; Jackson, 1893; T. L. Bancroft, 1893*d*, 1898, 1899*a*, 1899*b* and 1903*a*, 1900, 1901; P. Bancroft, 1893, 1908, 1910; Flynn, 1903; Sawkins, 1903; Macdonald, 1905; O'Brien, 1908; Jackson, 1908, 1910; Maclean, 1908, 1909, 1910; Salter, 1908; Breinl, 1913*b*, 1913*d*, 1913*e*; Jackson, 1913; Nicoll, 1914*d*; Nisbet, 1915; Booth-Clarkson, 1913; Harris and Elkington, 1912; Croll, 1911; Bancroft, 1912; Butler, 1912; Elkington, 1912; 1912*b*, 1912*c*; Breinl, 1911. 1915; Ham, 1909.

The participation of Australian troops in the Great War will almost certainly lead to the introduction, if not the establishing, of certain parasitic diseases from other lands. We know that many men have returned from New Guinea stricken with various forms of malaria*.

Giardia (*Lamblia*) *intestinalis* has caused severe diarrhœa both in Flanders and Gallipoli (Porter, Proc. Linn. Soc. Lond., 2nd March, 1916, No. 317). Amœbic dysentery (due to *Entamœba hystolytica*) occurred at the latter locality. Cameron (1916) has recorded its presence in a returned Queensland soldier.

In Egypt there is an abundant human helminth fauna, and it is possible that such trematodes as *Schistosomum*, *Heterophyces* and *Paragonimus* may be introduced to Australia. Leiper has recently investigated the life history† of *Schistosomum hæmatobium*, Bilh., and has

---

*Breinl and Priestley, 1916*a*.

†R. T. Leiper. Report on the Results of the Bilharzia Mission in Egypt, 1915. Jour. R.A. Medical Corps, July and Aug., 1915. Abstract in *Nature*, 13 January, 1916, p. 551.

proved that several species of a freshwater mollusc, *Planorbis* sp., can act as intermediate hosts. Species of this genus are common in our water supply and in ponds, and no doubt could serve as a host just as some other species of freshwater gastropods have become the intermediate hosts of the liver fluke, *Fasciola hepatica*, in Australia.

One need only mention that Ankylostomes are particularly abundant in Egypt. They are widely spread amongst the inhabitants of our own coastal districts.

Given certain conditions, there is danger that some of these parasites may become endemic.

MACACUS CYNOMOLGUS, Linn (macaque monkey—introduced).

I have identified both *Trichuris trichiura* and *Oesophagostoma apiostomum*, Will., amongst material collected in Queensland.

UNGULATA.

EQUUS CABALLUS, L. (Horse)—introduced.

c. *Anoplocephala perfoliata*, G., Jnstn., 1910*b*.

d. *Ascaris equorum*, G. (*A. megalocephala*, Cloq.), Jnstn, 1910*b*.

Oxyuris equi, Schr. (*O. curvula*, R.), Jnstn. 1916*c*.

Spiroptera (= *Acuaria*) *megastoma*, R., Tucker, 1914, N.Q ; Jnstn., 1914*c* (Burnett).

Habronema microstoma, Schn. Jnstn., 1916*c*.

Strongylus equinus, Mull. (*Strongylus armatus*), Cory, 1913, 1914 ; Jnstn., 1916*c*.

Cylicostomum tetracanthum, Mehl., Cory, 1913, 1914 ; Jnstn., 1916*c*.

e *Gastrophilus nasalis*, L , Tryon, 1908, 1910, 1912 ; Jarvis, 1913 (S.E.Q.).

SUS SCROFA, L. (pig)—introduced.

d. *Ascaris suum*, G., Jnstn, 1916*c*.

Stephanurus dentatus, Dies. (syn. *Sclerostoma pinguicola*, Verrill)—kidney worm—Bancroft, 1893*a*, *c* ; Dodd, 1909 ; Jnstn., 1910*b*., 1912*b* ; Cory, 1914.

BOS TAURUS, dom. (ox)—introduced.

a. "Sarcosporidiosis" Dodd, 1909 (=*Sarcocystis tenella*, Bl.)

Babesia bovis (generally known as *Piroplasma bigeminum*, Kilb. and Smith)—redwater parasite —Pound, 1895-1915; Fuller, 1896, 1899; Gordon, 1898-1903; Hunt, 1897-9; Hunt and Collins, 1896-7; Tidswell, 1899, 1900; Dodd, 1908, 1909, 1910; Richards, 1898; Greig Smith, 1899; Gilruth, 1912; Wynne, 1896; Thorn, 1912; Cory, 1912, 1913; Tucker, 1914; Wallace, 1908; Ramm, 1911; Barnes, 1896; Gordon and Pound, 1897.

Dr. Dodd (1910*d*) thought that there was a second parasite (? *Piroplasma mutans*) in Queensland cattle, but Thorn (1912) does not agree with him. Cory (1913) also suspected the presence of a second organism resembling *P. bigeminum.*

Anaplasma marginale, Theiler ? Gilruth, Sweet and Dodd, 1911.

b. Paramphistoma cervi (*Amphistomum conicum*), Cobb, 1891 (N.Q.); Jnstn., 1910*b*; Tryon, 1915 (Brisbane).

Fasciola hepatica, Abildg. Jnstn., 1910*b*, 1912*b*; Cory, 1912 (S.Q.).

c. Tænia, sp., Pound, 1899. (Probably=*Moniezia expansa*).

Moniezia expansa, R., Jnstn., 1910*b*.

Moniezia planissima, St. and Has. Jnstn., 1916*c*.

Echinococcus granulosus, Gm. (hydatid), Pound, 1899; Jnstn., 1910*b*.

Cysticercus bovis. This has not been recorded, but its presence may be inferred from the occurrence, though uncommon, of *Tænia saginata* in Queensland; Cory, 1912 (S.Q.).

d. Dictyocaulus viviparus, Bl. (syn. *Strongylus micrurus*, Mehlis). Cory, 1910*a*, 1912, records the presence of "lung worm" in calves.

Hæmonchus contortus, R. (stomach worm); Barnes, 1898; Dodd, 1908, 1909.

Trichostrongylus extenuatus, Raill. (syn. *Strongylus gracilis*, McFadyen, *nec* Leuckt), Dodd, 1909.

Ostertagia circumcincta, Stadelm (syn. *Strongylus cervinicornis*, McFad.), Dodd, 1909.

Oesophagostoma radiatum, Rud., Jnstn., 1910*b*, 1916*c*. (Brisbane).

Oesoph. columbianum, Curtice. Bancroft, 1893; Barnes, 1898. Should have been recorded as *Oes. radiatum* (*Oes. inflatum*, Schn.)

Trichuris ovis, Abildg. (syn. *Trichocephalus affinis*), Dodd, 1909; Jnstn., 1910*b*.

Onchocerca gibsoni, Clel. and Jnstn (the cause of worm nodules in Queensland cattle). For literature, see Jnstn., 1911*b*; Gibson, 1892; Bancroft, 1893*a*; Barnard and Park, 1894; Park, 1893; Pound, 1909; Tryon, 1910*a*, 1910*b*, 1911; Dodd, 1910; Cleland and Johnston, 1910*a*, 1910*b*, 1910*c*, 1910*h*, 1910*g*, 1911*a*, 1911*b*; Jnstn. and Clel., 1910*a*; Jnstn, 1911*b*, 1911*d*, 1916*b*; Robinson, 1910, 1911; Hancock, 1910; Macfadden, 1911; Leiper, 1911*a*, *b*; Gilruth, 1912; Gilruth and Sweet, 1911, 1912*a*, *b*; Breinl, 1913*a*; Nicoll, 1911, 1914*c*; Cleland, 1912, 1914*a*, 1914*b*; Thorn, 1912; Tryon, 1914; Pound, 1911; Nicoll, 1915*b*.*

e. *Hypoderma bovis*, L. (Warble), Tryon, 1912; 1915; McGown, 1915; Pound, 1915 (in imported cattle).

OVIS ARIES, L. (sheep)—introduced.

b. *Fasciola hepatica*, Abildg. (liver fluke), Jnstn., 1910*b*, 1912*b*.

---

*In a recent paper (1916*b*) in which I gave a summary of recent work relating to this parasite, I omitted any reference to Dr. Nicoll's last paper (1915*b*), as I was not aware of it until lately. He has published an account of his efforts to find worms and larvae in ten calves under a year old, in which he could not detect "worm nests" whilst the animals were alive. His findings were all negative though the parasites were searched for in a most careful manner.

c. *Moniezia expansa*, R., Jnstn., 1916*c*.

Echinococcus granulosus, Gm. (hydatid), Jnstn., 1910*b*.

Tænia hydatigena, Pall.—larva (*Cysticercus tenuicollis*, Dies.), Jnstn., 1916*c*.

d. *Hæmonchus contortus*, R. (stomach worm), Barnes, 1898 ; Dodd, 1908, 1909 ; Cory, 1914 ; Brown, 1913. There are many references to "stomach worms" —Cory, Tucker, Brown.

Trichostrongylus extenuatus, Raill. (syn. *Strongylus gracilis*, McFadyen), Dodd, 1909.

Ostertagia circumcincta, Stadelm. (syn. *Strongylus cervinicornis*, McFadyen), Dodd, 1909.

Dictyocaulus filaria, Rud. (lung-worm), Jnstn., 1910*b*.

Oesophagostoma columbianum, Curtice ; Barnes, 1898 ; Jnstn., 1910*b*.

Trichuris ovis, Abildg. ; Jnstn, 1910*b* ; 1916*c* (Burpengary, per H. Tryon—collected by W. G. Brown).

Onchocerca gibsoni, C. and J., Pound, 1911.

Oestrus ovis, L.—sheep bot. Tryon, 1907, 1914, 1915 ; Jarvis, 1913 (S.Q.) ; Brown, 1913, 1914.

CAPRA HIRCUS, L. (goat)—introduced.

Echinococcus granulosus, Gm. (hydatid), Jnstn., 1910*f*.

CARNIVORA.

CANIS FAMILIARIS, L.—dog—introduced.

c. *Dipylidium caninum*, L., Jnstn., 1912*b* (Brisbane), 1913 (N.Q.) ; Nicoll, 1914*d* (N.Q.).

Echinococcus granulosus, Gmel. (generally known as *Tænia echinococcus*, Sieb.) The presence of the adult stage of this parasite in dogs may be safely inferred from the occurrence of the hydatid stage in various animals in this State.

Tænia hydatigena, Pall. (syn. T. *marginata*, Batsch—its presence in dogs may be inferred from the occurrence of *Cysticercus tenuicollis*, Dies.

d. *Toxascaris* (=*Toxocara*) *canis*, Werner. Jnstn., 1912*b* (Brisbane) ; Nicoll, 1914*d* (Ascarids—N.Q.)

Ancylostoma caninum, Ercol (hookworm), Bancroft, 1901*a*; Jnstn., 1912*b* (Brisbane); Breinl, 1913*d*; Nicoll, 1914*d* (N.Q.)

Dirofilaria immitis, Leidy (heart worm), Bancroft, 1389, 1893 (Brisbane); Breinl, 1913*d*; Nicoll, 1899, 1893*c*, 1901*a*, 1903*b* (Brisbane); Breinl, 1913*d*; Nicoll, 1914*d* (N.Q); Tucker, 1912 (N Q.).

FELIS CATUS, dom. (cat)—introduced.

c. *Dibothriocephalus felis*, Cr., Jnstn., 1912*b* (S.Q.), 1913 (N.Q.).

Tænia tæniæformis, Bl. (generally known as *T. crassicollis*, R.), Jnstn., 1912*b*.

Dipylidium caninum, L., Jnstn, 1912*b* (S.Q.); Nicoll, 1914*d* (N.Q.).

d *Belascaris felis*, G. (syn. *Asc. mystax*, R.), Jnstn, 1912*b*.

Ancylostoma caninum, Erc., Jnstn. 1912*b* (S.Q.); Breinl, 1913*d* (N.Q.).

RODENTIA.

MUS MUSCULUS, L. (mouse)—introduced.

c. *Tænia tæniæformis*, Bl., in its cystic stage (*Cysticercus fasciolaris*), Jnstn., 1916*c*.

d. *Oxyuris obvelata*, Brems., Jnstn., 1912*b*.

Capillaria hepatica, Raill. (syn. *Trichosoma hepaticum*), Jnstn., 1912*b*.

Spiroptera (= *Acuaria*) *obtusa*, R., Jnstn., 1912*b*.

EPIMYS NORVEGICUS, Erxl. (syn. *Mus decumanus*, Pall—the brown rat)—introduced.

a *Trypanosoma lewisi*, Kent., Pound, 1907 (Brisbane).

c *Hymenolepis diminuta*, R , Jnstn , 1912*b* (Brisbane), 1913 (N Q)

Tænia tæniæformis, Bl , in its cystic stage (*Cysticercus fasciolaris*), Jnstn , 1912*b* (Brisbane).

d *Heterakis spumosa*, Schn., Jnstn., 1912*b*.

Oxyuris obvelata, Brems., Jnstn., 1912*b*.

Spiroptera obtusa, R., Jnstn., 1912*b*.

Capillaria hepatica, Raill., Jnstn., 1912*b*.

Trichodes crassicanda, Bell. Jnstn., 1912*b*.
Gigantorhynchus moniliformis, Br., Jnstn., 1913 (N.Q.).

Epimys rattus, L., including var. **alexandrinus** (house rat)—introduced.

a *Trypanosoma lewisi,* Kent., Jnstn., 1916*c* (Brisbane).

c *Hymenolepis diminuta,* R., Jnstn., 1912*b*.

Tænia tæniæformis, Bl. (*Cysticercus fasciolaris,* R.)—Jnstn., 1912*b* (Brisbane).

d *Heterakis spumosa,* Schn., Jnstn., 1912*b*.
Oxyuris obvelata, Brems., Jnstn., 1912*b*.

Capillaria hepatica, Raill., Bancroft, 1893 (as *Trichocephalus hepaticus,* Bancr.); Jnstn., 1912*b* (Brisbane).

Spiroptera obtusa, R., Jnstn., 1912*b*.

Gigantorhynchus moniliformis, Br.. Jnstn., 1912*b* (Brisbane).

Rats (unspecified).

a *Trypanosoma lewisi,* Kent., Bancroft, 1888 (Brisbane—as *Hæmatomonas* sp.), Breinl, 1913*c* (N.Q.)

Coccidium sp. from rat's liver, Bancroft, 1891. (=ova of *Capillaria hepaticum,* Raill., a nematode).

d *Gigantorhynchus moniliformis,* Br., Nicoll, 1914*d* (N.Q.)

CHIROPTERA.

Pteropus gouldi, Peters. (Gould's flying fox).

a *Trypanosoma pteropi,* Breinl, 1913*c* (N.Q.)
Plasmodium pteropi, Breinl, 1913*c* (N.Q.).

Pteropus poliocephalus, Temm.

c *Hymenolepis* sp. Jnstn., 1916*c* (Caloundra).

d *Filaria* sp., in body cavity. Jnstn., 1916*c* (Brisbane).

SIRENIA.

Dugong dugon, Mull. (syn. **Halicore dugong**)—dugong.

b *Opisthotrema pulmonale,* Linstow, 1904 (Torres Straits).
Rhabdiopœus taylori, S. J. Jnstn., 1913 (N.Q.)

MARSUPIALIA.

MACROPUS GIGANTEUS, Zimm. (syn. *M. major*, Shaw)—kangaroo.

d Filaria websteri, Cobb., Jnstn, 1912*b*; T. L. Bancroft, 1889 (as *Filaria* sp.).

MACROPUS DORSALIS, Gray.

c Echinococcus granulosus, Gm. (hydatid), T. L. Bancroft, 1890.

d Filaria websteri, Cobbold, Jnstn., 1912*b*.

MACROPUS PARRYI, Bennett.

a Coccidium (*Eimeria*) sp., Jnstn., 1910*f*.

d Filaria websteri, Cobb, Jnstn., 1912*b*.

MACROPUS DERBYANUS, Gray.

c Moniezia festiva, Rud., Cobbold, 1879 (from Dr. J. Bancroft's collection, and presumably from Queensland).

=HALMATURUS sp. (=MACROPUS sp.).

c Tœnia mastersii, Krefft, 1871.

KANGAROO (probably=*M. giganteus*).

d Filaria websteri, Cobbold, 1879; Bancroft, 1893*c*.

WALLABIES.

c ? Bothriocephalus marginatus, Krefft, 1871.

Tœnia fimbriata, Krefft, 1871, nec. Diesing=*T. Krefftii*, Jnstn., 1909*e*, and is probably a *Cittotœnia*.

DENDROLAGUS BENNETTIANUS, De Vis, a tree kangaroo.

d Filaria sp., Jnstn , 1910*e*; 1911*a* (N.Q).

ONYCHOGALE FRENATA, Gould; a nail-tailed wallaby.

c Cittotœnia bancrofti, Jnstn., 1912*b*.

PHASCOLARCTUS CINEREUS, Goldf.—native bear.

c Bertiella obesa, Zsch., 1898, 1899. Cobbold's *Tœnia geophiloides*, 1879—a nomen nudum—is the same.

TRICHOSURUS VULPECULA, Kerr—common opossum.

d Filaria dentifera, Linstow, 1898 (Burnett).

Filaria trichosuri, Breinl, 1913*d*. (N.Q.).

PERAMELES OBESULA, Shaw—bandicoot.

c *Linstowia semoni*, Zsch., 1898, 1899 (Burnett).

d *Echinonema cinctum*, Linst., 1898 (Burnett).

Gigantorhynchus semoni, Linst., 1898 (Burnett).

MONOTREMATA.

TACHYGLOSSUS ACULEATUS, Shaw (syn. *Echidna hystrix*, Home)—the echidna or ant-eater.

c *Linstowia echidnæ*, Thomp., Zschokke, 1898, 1899. I have received specimens from the Upper Burnett (Dr. T. L. Bancroft). Cobbold's *Tænia phoptica* (1879)—a nomen nudum—belongs to the same species.

Cittotænia tachyglossi, Jnstn., 1913 (N.Q.).

Cittotænia sp., Nicoll, 1914*d* (N.Q.).

AVES.

CASUARIIFORMES sp.

DROMÆUS NOVÆHOLLANDIÆ, Lath (The emu).

c *Davainea australis*, Kr., Johnston, 1916c (Eidsvold).

GALLIFORMES.

CATHETURUS LATHAMI, Gray (The brush turkey).

a *Hæmoproteus* sp.* Cleland and Johnston, 1911c (S.Q.) ; Cleland, 1915*b*. (S.Q.).

d *Heterakis bancrofti*, Jnstn, 1912*b*. (S.Q.).

Heterakis catheturinus, Jnstn., 1912*b* (S.Q.)

Echinorhynchus (*Gigantorhynchus*) sp., Jnstn., 1912c (S.Q.).

GALLUS DOMESTICUS (the domestic fowl)—introduced.

a *Spiroschaudinnia* (*Spirochæta*, *Treponema*) *gallinarum*, March—organism of fowl tick-fever. Dodd, 1909.

---

*Generally recorded as *Halteridium* but *Hæmoproteus* appears to be the correct name. Minchin (Intro. Study Protozoa, 1912), however prefers the former.

c *Hymenolepis carioca*, Mag., Jnstn., 1912*b* (Brisbane).

Amœbotænia cuneata, Linst., Jnstn., 1912*b* (Brisbane).

Davainea cesticillus, Molin., Jnstn, 1912*b* (Brisbane).

Davainea tetragona, Molin*, Sweet, 1910 (Rockhampton); Jnstn., 1912*b* (Brisbane).

d *Ascaridia perspicilla* (syn. *Heterakis inflexa*, R.), Jnstn., 1912*b* (Brisbane); Nicoll, 1914*d* (N.Q.); Tryon, 1915; Jnstn., 1912*b* (Brisbane).

Heterakis vesicularis (syn. *H. papillosa*, Bl.), Jnstn., 1912*b* (Brisbane); Nicoll, 1914*d* (N.Q.)

Oxyspirura parvovum, Sweet, 1910 (Rockhampton, Cairns); Breinl, 1913*d* (N.Q.); Nicoll, 1914*d* (N.Q.)

Oxyspirura mansoni, Cobbold. Tryon, 1908 (N.Q.); Dodd, 1909 (N.Q.)—probably the same as the preceding species.

COLUMBIFORMES.

LAMPROTRERON SUPERBA, Temm. (purple-breasted fruit pigeon).

a *Hæmoproteus columbæ*, C. and S., Breinl, 1913*c* (N.Q.)

RALLIFORMES.

PORPHYRIO MELANONOTUS, Temm. (bald coot).

b *Echinostoma hilliferum*, Nicoll, 1914*b* (N.Q.)

CHARADRIIFORMES.

LOBIVANELLUS LOBATUS, Vieill. (Spurwing plover).

b *Echinostoma ignavum*, Nicoll, 1914*b* (N.Q.)

Hæmatotrephus consimilis, Nicoll, 1914*b* (N.Q.)

Notocotylus attenuatus, Rud., Nicoll, 1914*b* (N.Q.)

c *Gyrocœlia* sp., Jnstn., 1914*a* (N.Q.)

NUMENIUS CYANOPUS, Vieill (sea curlew).

b *Echinostoma* (*Acanthochasmus*) sp., Jnstn., 1912*c* (Gladstone).

d *Echinorhynchus* sp., Jnstn., 1912*c* (Gladstone), 1914*a* (N.Q.)

---

*Attention is drawn to a misprint in Johnston, 1910*g*, p. 117, where should read that *Davainea* sp. Bradshaw is *D. tetragona*, Molin.

GALLINAGO AUSTRALIS, Lath. (snipe).
c *Aploparaksis australis*, Jnstn., 1913 (N.Q.)

BURHINUS GRALLARIUS, Lath. (stone plover; land curlew).
b *Platynotrema biliosum*, Nicoll, 1914*b* (N.Q.).
Platynotrema jecoris, Nicoll, 1914*b* (N.Q.).
Notocotylus attenuatus, Rud., Nicoll, 1914*b* (N.Q.)

GRUIFORMES.

ANTIGONE AUSTRALASIANA, Gould (native companion).
b *Allopyge antigones*, S. J. Jnstn., 1913 (N.Q.).
Echinostoma australasianum, Nicoll, 1914*a* (N.Q.)

IBIDIFORMES.

IBIS MOLUCCA, Cuv. (white ibis).
b *Echinostoma* sp., Jnstn., 1912*c* (Eidsvold)=*Patagifer bilobus*, R., Jnstn., 1916*c*.
Platynotrema biliosum, Nicoll, 1914*b* (N.Q.).

CARPHIBIS SPINICOLLIS, Reichb. (straw-necked ibis).
b *Echinostoma acuticauda*, Nicoll, 1914*b* (N.Q.)
Patagifer bilobus, R., Nicoll, 1914*b* (N.Q.).

PLEGADIS FALCINELLUS, Linn. (glassy ibis).
b *Patagifer bilobus*, R., Nicoll, 1914*b* (N.Q.).

PLATALEA REGIA, Gould (blackbilled spoonbill).
b *Orchipedum sufflavum*, Nicoll, 1914*b* (N.Q.)
Patagifer bilobus, R., S. J. Jnstn., 1913 (N.Q.)
c *Cyclorchida omalancristrota*, Wed., Jnstn., 1913 (N.Q.).

PLATIBIS FLAVIPES, Gould (yellow-billed spoonbill).
c *Hymenolepis ibidis*, Jnstn., 1913 (N.Q.).

CICONIIFORMES.

XENORHYNCHUS ASIATICUS, Lath. (jabiru; Australian stork).
b *Chaunocephalus ferox*, Rud., Nicoll, 1914*b*. (N.Q.)

ARDEIFORMES.

HERIODAS TIMORIENSIS, Less. (white egret).
b *Echinostoma* sp., Jnstn., 1912*c*. (S.Q.).
c *Anomotœnia asymmetrica*, Jnstn., 1913 (N.Q.)
Bancroftiella glandularis, Fuhr., Jnstn., 1913 (N.Q.)

NOTOPHOYX NOVÆHOLLANDIÆ, Lath. (white-fronted heron).

a *Trypanosoma notophoyxis*, Breinl, 1913*c* (N.Q.).
Hæmoproteus danilewskyi, Gr. and Fel., Breinl, 1913*c* (N.Q.)

c *Bancroftiella glandularis*, Fuhrm., Jnstn., 1913 (N.Q.); 1914*a* (N.Q.).

NYCTICORAX CALEDONICUS, Gmel. (night heron).

b *Clinostomum hornum*, Nicoll, 1914*b* (N.Q.).

c *Bancroftiella ardeæ*, Jnstn., 1913 (N.Q.).

BOTAURUS PŒCILOPTILUS, Wagl. (bittern).

b *Clinostomum hornum*, Nicoll, 1914*b* (N.Q.).

ANSERIFORMES.

CHENOPSIS ATRATA, Lath. (black swan).

a ? *Plasmodium** (*Proteosoma*) *biziuræ*, Gilr. and Sweet. Cleland, 1915 (Burnett R.).

b *Echinostoma revolutum*, R., Nicoll, 1914*b* (N.Q.).
Notocotylus attenuatus, R., Nicoll, 1914*b* (N.Q.).

ANSERANAS SEMIPALMATA, Lath. (pied goose).

b *Typhlocœlium reticulare*, S. J. Jnstn., 1913 (N.Q.)
Echinostoma revolutum, R., Nicoll, 1914*b* (N.Q.).
Notocotylus attenuatus, R., Nicoll, 1914*b* (N.Q.).

c *Hymenolepis megalops*, Nitzsch., Jnstn., 1913 (N.Q.).
Hymenolepis terræreginæ, Jnstn., 1913 (N.Q.)

NETTOPUS PULCHELLUS, Gould (green gooseteal).

b *Echinostoma revolutum*, R., Nicoll, 1914*b* (N.Q.).
Notocotylus attenuatus, R., Nicoll, 1914*b* (N.Q.).

DENDROCYGNA ARCUATA, Horsf. (whistling duck).

c *Diploposthe lævis*, Bl., Jnstn., 1913 (N.Q.).

ANAS SUPERCILIOSA, Gmel. (black duck).

b *Echinostoma* sp. (= *E. revolutum*), Jnstn., 1912*b* (S.Q.)
Echinostoma revolutum, R., S. J. Jnstn., 1913 (N.Q.); Nicoll, 1914*b* (N.Q.).

Notocotylus attenuatus, R., Nicoll, 1914*b* (N.Q.).

---

*Minchin (An Introd. to the Study of Protozoa, 1912, p. 358) regards the correct generic name to be *Plasmodium*, whilst Doflein (Lehrb. Protozoenk, 1911, p. 771) retains *Proteosoma*.

c *Diorchis flavescens*, Krft., Jnstn., 1912*b* (S.Q.); 1913 (N.Q.).
Hymenolepis megalops N., Jnstn, 1912*b* (S.Q.).

AYTHYA AUSTRALIS, Eyton (Widgeon, white-eyed duck).
c *Diploposthe lævis*, Bl., Jnstn., 1912*b* (S.Q.)

PELICANIFORMES (STEGANOPODES).

PHALACROCORAX SULCIROSTRIS, Brandt (little black cormorant).
d *Ascaris spiculigera*, R., Jnstn., 1912*b* (S.Q.).
Filaria sp., Jnstn., 1912*b* (S.Q.); Cleland, 1915 (S.Q.).

PLOTUS NOVÆHOLLANDIÆ. Gould (snake bird, darter).
d *Ascaris spiculigera*, R., Jnstn., 1912*b* (S.Q.).
Filaria sp., Jnstn., 1912*b* (S.Q.); Cleland, 1915*b* (S.Q.).

FREGATA AQUILA, L. (frigate bird).
c *Tetrabothrius* sp., Jnstn., 1912*c* (Masthead I.).

ACCIPITRIFORMES.

ASTUR NOVÆHOLLANDIÆ, Gm. (white goshawk).
d *Gigantorhynchus asturinus*, Jnstn., 1912*b* (N.Q.).

ACCIPITER CIRRHOCEPHALUS, Vieill (sparrow hawk).
c *Anomotænia accipitris*, Jnstn., 1913 (N.Q.)
d *Filaria* sp., Clel and Jnstn, 1911*c* (S.Q.).

HALIASTUR GIRRENERA, Vieill. (white-headed sea-eagle).
a *Trypanosoma avium majus*, Dainl. Breinl, 1913*c* (N.Q.)
Hæmoproteus danilewskyi, G. and F., Breinl, 1913*c* (N.Q.).

FALCO HYPOLEUCUS, Gould (grey falcon).
a *Trypanosoma avium*, Dainl., Breinl, 1913*c* (N.Q.).
Proteosoma præcox, G. and F., Breinl, 1913*c* (N.Q.).

HIERACIDEA BERIGORA, V. and A. (striped brown hawk).
b *Opisthorchis obsequens*, Nicoll, 1914*b* (N.Q.).

HIERACIDEA ORIENTALIS, Schl. (brown hawk*).
b *Opisthorchis obsequens*, Nicoll, 1914*b* (N.Q.).
Echinochasmus prosthovitellatus, Nicoll, 1914*b* (N.Q.).

---

*Nicoll, 1914*d*, mentions the occurrence of eye worms in the brown hawk and in the wedgetailed eagle (= *Uroætus audax*) in N.Q.

STRIGIFORMES.

NINOX BOOBOOK, Lath. (boobook owl).

a *Trypanosoma* sp., Breinl, 1913*c* (N.Q.).

Hæmoproteus noctuæ, Sch., Breinl., 1913*c* (N.Q.).

Hæmoproteus (*Halteridium*) sp., Clel. and Jnstn., 1911*c*, (S.Q.); Clel., 1915*b* (S.Q.); apparently the same as the preceding.

b *Strigea promiscua*, Nicoll, 1914*a* (N.Q.).

d *Echinorhynchus* sp., Jnstn., 1912*c*, (S.Q.).

NINOX MACULATA, V. and H. (spotted owl).

b *Hemistomum brachyurum*, Nicoll, 1914*a* (N.Q.).

Strigea promiscua, Nicoll, 1914*a* (N.Q.).

NINOX STRENUA, Gould (powerful owl).

a *Hæmoproteus* sp., Cleland, 1915*b* (S.Q.).

PSITTACIFORMES.

TRICHOGLOSSUS NOVÆHOLLANDIÆ, Gm. (bluebellied lorikeet, Blue Mountains parrokeet).

c *Moniezia trichoglossi*, Linstow, 1888 (Cape York); Jnstn., 1912*c* (N.Q.); 1913 (N.Q.).

d *Filaria* sp., Bancroft, 1889; 1893*c* (S.Q.).

GLOSSOPSITTACUS PUSILLUS, Shaw (small green leek; little lorikeet).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (Gladstone, Burnett).

CACATUA GALERITA, Lath. (white cockatoo; sulphur-crested cockatoo).

c *Davainea cacatuina*, Jnstn., 1913 (N.Q.).

PLATYCERCUS EXIMIUS, Shaw (rosella parrokeet).

c *Dilepis bancrofti*, Jnstn., 1912*d* (S.Q.).

CORACIIFORMES.

PODARGUS STRIGOIDES, Lath. (mopoke).

a *Leucocytozoon* sp., Cleland, 1915*b* (S.Q.).

b *Strigea flosculus*, Nicoll, 1914*a* (N.Q.).

d *Filaria* sp., Bancroft, 1889; Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

NIGHTJAR, probably P. STRIGOIDES.

d. Echinostoma elongatum, Nicoll, 1914*a* (N.Q.).

ÆGOTHELES NOVÆHOLLANDIÆ, Lath. A nightjar.

d. Filaria sp. (microfilaria). Jnstn., 1916*c* (Eidsvold).

EURYSTOMUS PACIFICUS, Lath. (Dollar bird, Roller).

d Filaria sp., Bancroft, 1889; Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

Echinorhynchus sp., Jnstn., 1912*c* (S.Q.).

DACELO LEACHII, V. and H. (Leach's Kookooburra).

d Filaria dacelonis, Breinl, 1913*d* (N.Q.). This parasite belongs to the genus *Ceratospira* =[*C. dacelonis* (Breinl), Jnstn., 1916].

MEROPS ORNATUS, Lath. (bee eater).

a Hæmoproteus sp., Clel. and Jnstn., 1911*c* (S.Q.).

CUCULIFORMES (COCCYGES).

EUDYNAMIS CYNAOCEPHALA, Lath. (a cuckoo).

a Hæmoproteus danilewskyi, G. and F., Breinl, 1913*c* (N.Q.).

CENTROPUS PHASIANUS, Lath. (Coucal, pheasant cuckoo).

b Echinostoma emollitum, Nicoll, 1914*b* (N.Q.).

PASSERIFORMES.

PITTA STREPITANS, Temm (noisy Pitta).

d Microfilaria sp., Breinl, 1913*d* (N.Q.).

MICRŒCA FASCINANS, Lath (brown flycatcher).

a Trypanosoma anellobiæ, Clel. and Jnstn, 1911*e* (S.Q.). It probably belongs to a different species.

Hæmoproteus sp., Clel. and Jnstn., 1911*c* (S.Q.)

b Echinostoma sp., Jnstn., 1912*c*. (S.Q.).

MYIAGRA RUBECULA, Lath. (leaden flycatcher).

d Filaria sp., Bancroft, 1889 (S.Q.).

CORACINA ROBUSTA, Lath. (blue jay; cuckoo shrike).

d Filaria sp. Jnstn., 1912*c* (Burnett R.)

PSOPHODES CREPITANS, Lath. (coachwhip).

d *Filaria* sp. Clel. and Jnstn., 1911*c* (S.Q.).

POMATOSTOMUS FRIVOLUS, Lath (babbler, twelve apostles).

d *Filaria* sp., Bancroft, 1889 (S.Q.).

MEGALURUS GRAMINEUS, Gould (grass bird).

a *Hæmoproteus danilewskyi*, G. and F., Breinl, 1913*c*. (N.Q.).

ARTAMUS LEUCOGASTER, Val. (white-breasted wood swallow).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

ARTAMUS TENEBROSUS, Lath. (brown wood swallow).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

GRALLINA PICATA, Lath. (peewit).

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c* (S.Q.).

d *Echinorhynchus* sp., Jnstn., 1912*c*, 1914 (N.Q.).

GYMNORHINA TIBICEN, Lath. (magpie).

d *Filaria* spp., Bancroft, 1889 (S.Q.).

Filaria clelandi, Jnstn., 1912*b*. (S.Q.).

CRACTICUS NIGRIGULARIS, Gould (black-throated butcher bird).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (Gladstone).

CRACTICUS DESTRUCTOR, Temm. (the butcher bird).

a *Hæmoproteus danilewskyi*, G. and F., Breinl, 1913*c* (N.Q.).

d *Filaria* sp., Bancroft, 1889 (S.Q.).

PACHYCEPHALA RUFIVENTRIS, Lath. (rufous-breasted thickhead).

c *Sphæruterina punctata*, Jnstn., 1914*c* (S.Q.).

ZOSTEROPS CAERULESCENS, Lath. (silver-eye).

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c* (S.Q.).

PARDALOTUS MELANOCEPHALUS, Gould (black headed pardalcte).

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

**Leucocytozoon anellobiæ*, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).

* *Trypanosoma anellobiæ*, Clel. and Jnstn., 1911*c* (S.Q.).

d *Microfilaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

PLECTORHAMPHUS LANCEOLATUS, Gould (striped honey-eater).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

MYZOMELA SANGUINEOLENTA, Lath. (blood-bird).

a *Trypanosoma* sp., probably *Tr. anellobiæ*; Clel. 1915*b* (S.Q.).

Hæmoproteus sp., Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

d *Filaria* sp., Clel. and Jnstn., 1911*c*; Clel., 1915*b* (S.Q.).

CONOPOPHILA ALBIGULARIS, Gould (white-throated honey-eater).

c *Davainea conopophilæ*, Jnstn., 1913 (N.Q.).

STIGMATOPS OCULARIS, Gould (a brown honey-eater).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (Gladstone).

PTILOTIS FUSCA, Gould (a brown honey-eater).

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c* (S.Q.).

Trypanosoma anellobiæ, Clel. and Jnstn., 1911*c* (S.Q.).

---

*Two fairly distinct types of trypanosomes have been recorded by Dr. Cleland and myself (1911*c*) from Queensland birds viz., a broad type occurring in *Micrœca* and *Pardalotus* and a narrower one found especially in the Meliphagidæ (honey-eaters), though in this family both are sometimes met with. Intermediate forms have been seen by us. Danilewsky found the same differences elsewhere in regard to his *Tryp. avium* with which Dr. Breinl (1915) has since identified some parasites from Northern Queensland birds. Though we included all our Trypanosomes from birds under the name *T. anellobiæ*, it is quite likely that there may be slight morphological or physiological differences of specific value. The same remark holds good regarding *Leucocytozoon anellobiæ*, which we have recorded from a considerable number of Queensland birds. It should be mentioned that Dr. Cleland believes that this last named parasite is an intracorpuscular phase of a trypanosome ("Australian Hæmatozoa," Med. Jour. Austr., 1914, 1., p. 240).

Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).

d *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

MYZANTHA GARRULA, Lath. (soldier bird; noisy minah).

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c* (S.Q.).

Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).

d *Filaria* sp., Bancroft, 1889; Clel. and Jnstn., 1911*c* (S.Q.).

ANELLOBIA CHRYSOPTERA, Lath. (brush wattle bird)

a *Trypanosoma anellobiæ*, Clel. and Jnstn., 1911*c*, 1912*a* (S.Q.).

Hæmoproteus danilewskyi, Breinl, 1913*c* (N.Q.).

Leucocytozoon anellobiæ, Jnstn., 1912*c*, Clel. and Jnstn. 1911*c* (S Q.).

d *Filaria* sp., Bancroft, 1889; Jnstn., 1910*g*; Clel. and Jnstn., 1910*d*, 1912*c* (S.Q.).

ANELLOBIA LUNULATA, Gould.

The parasites listed by Bancroft (1890*a*), and by me (1910*g*) under this host belong to the preceding host species.

ENTOMYZA CYANOTIS, Lath. (blue-faced honey-eater).

a *Trypanosoma anellobiæ*, Clel. and Jnstn., 1911*c* (S.Q.)

Hæmoproteus sp., Clel. and Jnstn., 1911*c* (S.Q.).

Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).

c *Davainea conopophilæ*, Jnstn., 1913 (N.Q.).

d *Filaria* sp., Bancroft, 1889 (S.Q.); Clel. and Jnstn., 1911*c* (Gladstone, Burnett R.).

TROPIDORHYNCHUS CORNICULATUS, Lath. (friar bird),

a *Hæmoproteus* sp., Clel. and Jnstn., 1911*c* (S.Q.). leatherhead).

Leucocytozoon sp., Breinl, 1913*c* (N.Q.) is probably *L. anellobiæ*—Jnstn., 1916.

PHILEMON CITREIGULARIS, Gould (yellow-throated friar bird).

c *Davainea conopophilæ*, Jnstn., 1913 (N.Q.).

d *Filaria* sp., Jnstn., 1912*b* (S.Q.).

ORIOLUS SAGITTARIUS, Lath. (the oriole).
- *a* *Trypanosoma anellobiæ*, Clel. and Jnstn., 1911*c* (S.Q.).
  Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).
  Hæmoproteus sp., Clel. and Jnstn., 1911*c* (S Q.).
- *d* *Filaria* sp., Bancroft, 1889*a*, Clel. and Jnstn , 1911*c* (S.Q.).

SPHECOTHERES MAXILLARIS, Lath. (fig bird).
- *a* *Leucocytozoon anellobiæ*, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).
- *c* *Davainea sphecotheridis*, Jnstn , 1914 (N.Q., Burnett R.).

CHIBIA (DICRURA) BRACTEATA, Gould.
- *a* *Hæmoproteus danilewskyi*, G. and F., Breinl, 1913*c* (N.Q.).
- *b* *Lepoderma nisbetii*, Nicoll, 1914*a* (N.Q.).
  Prosthogonimus vitellatus, Nicoll, 1914*a* (N.Q.).
- *d* *Filaria* sp., Bancroft, 1889 (S.Q.).

CHLAMYDODERA ORIENTALIS, Gould (Queensland bower bird).
- *a* *Trypanosoma chlamydoderæ*, Breinl, 1913*c* (N.Q).
  Hæmoproteus danilewskyi, G. and F., Breinl, 1913*c* (N Q.).

SERICULUS CHRYSOCEPHALUS, Lewin (regent bird).
- *d* *Filaria* sp., Bancroft, 1890*a* (S.Q.).

CRASPEDOPHORA ALBERTI, Elliot (Cape York rifle bird)
- *c* *Biuterina clavulus*, Linstow, 1888 (Cape York).

*CORVUS CORONOIDES, V. and H.
- *d* *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

*CORONE AUSTRALIS, Gould.
- *d* *Filaria* sp., Bancroft, 1889 (S.Q.).

STREPERA GRACULINA, White (pied Crowshrike; crow magpie).
- *d* *Filaria* sp., Bancroft, 1889 (S.Q.).

STRUTHIDEA CINEREA, Gould (grey jumper; happy family).
- *d* *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

---

*See "*Emu*," xii., July, 1912, p. 44, regarding the confusion in the nomenclature of these two birds, as to which is the crow and which the raven.

CORCORAX MELANORHAMPHUS, Vieill. (chough ; mutton bird).
a ? *Trypanosoma* sp., Clel. and Jnstn., 1911*c* (S.Q.).
Leucocytozoon anellobiæ, Jnstn., Clel. and Jnstn., 1911*c* (S.Q.).
d *Filaria* sp., Clel. and Jnstn., 1911*c* (S.Q.).

REPTILIA.

CHELONIA.

CHELODINA LONGICOLLIS, Shaw (long-necked tortoise).
a *Trypanosoma chelodina*, Johnson, J. and C., 1911*a* (Burnett) ; Breinl, 1913*c* (N.Q.).
Hæmogregarina clelandi, Jnstn*, Jnstn. and Clel., 1911*a* ; C. and J., 1912*a* (Burnett) ; Breinl, 1913*c* (N.Q.).

CHELODINA EXPANSA, Gray (lagoon tortoise).
a *Hæmogregarines*, Plimmer, 1915 (Q.) —almost certainly = *H. clelandi*, Jnstn.

EMYDURA KREFFTII, Gray (Krefft's tortoise).
a *Trypanosoma chelodina*, Johnson, J. and C., 1911*a* (S.Q.)
Hæmogregarina clelandi, Jnstn., J. and C, 1911*a* (S.Q.).

EMYDURA LATISTERNUM, Gray.
b *Aptorchis æqualis*, Nicoll, 1914*a* (N.Q.).

EMYDURA MACQUARIÆ, Gray.
a *Trypanosoma chelodina*, Jnstn., 1911*f* (S.Q.).
Hæmogregarina clelandi, Jnstn., Jnstn, 1911*f* (S.Q.)
Hæmocystidium chelodinæ, J. and C., Jnstn., 1911*f* (S.Q.).
These three Hæmoprotozoa were listed under *Emydura Krefftii* by Johnston and Cleland, 1910*c* ; C. and J., 1912*a*.

ELSEYA DENTATA, Gray.
b *Amphistoma* sp., Krefft, 1871 (N.Q.).
d *Ascaris* sp., Krefft, 1871 (N.Q.).

---

* *Hæmogr. dentata*, Lewis (Bull. North Territory, 8, 1913, p. 34), from *Elseya dentata*, from Darwin, is probably a synonym.

CHELONIA MYDAS, Linn. (green turtle).

b *Amphistoma scleroporum*, Crepl., Jnstn., 1911*f* (Masthead I.).

Octangium sagitta, Looss., Jnstn., 1911*f* (Masthead I.); S. J. Jnstn. 1913 (N.Q.).

Polyangium linguatula, S. J. Jnstn., 1913 (N.Q.).

Diaschistorchis pandus, Braun., S. J. Jnstn., 1913 (N.Q.).

LACERTILIA.

VARANUS VARIUS, Shaw (lace lizard, monitor, common tree "goanna.")

a *Hæmogregarina** *varanicola*, J. and C., 1911*a* (S.Q.); C. and J., 1912*a* (S.Q.); Breinl, 1913*c* (N.Q.).

b *Sparganum* sp., Jnstn., 1911*f* (S.Q.); Nicoll, 1914*d* (N.Q.).

Acanthotænia tidswelli, Jnstn., 1913 (N.Q.).

Acanthotænia sp. (pleroceroid), Jnstn., 1914 (N.Q.).

Bothridium parvum, Jnstn., 1913 (N.Q.).

d *Physaloptera varani* ? Jnstn., 1916 (S.Q.).

VARANUS BELLII, D. and B. (perhaps only a well-marked variety of the last-named monitor).

a *Hæmogregarina varanicola*, J. and C., Jnstn., 1912*b* (S.Q.).

c *Acanthotænia tidswelli*, Jnstn., 1912*b* (S.Q.).

d *Physaloptera varani* ? Jnstn., 1912*b* (S.Q.).

VARANUS GOULDII, Gray (Gould's monitor: sand "goanna").

a *Hæmogregarina gouldii*, J. and C., 1911*a* (S.Q.).

c *Acanthotænia tidswelli*, Jnstn., 1911*f* (S.Q.).

Sparganum sp., Jnstn., 1911*f* (S.Q.).

d *Physaloptera varani* ? St., Jnstn., 1911*f* (S.Q.).

PHYSIGNATHUS LESUEURII, Gray (water lizard, water dragon).

d *Filaria physignathi*, Jnstn., 1912*b*; J. and C., 1911*a* (S.Q.).

CHLAMYDOSAURUS KINGII, Gray (frilled lizard).

c *Sparganum* sp., Jnstn., 1914 (N.Q.); 1916*a* (S.Q.).

d *Filaria chlamydosauri*, Breinl, 1913*d* (N.Q.).

---

* The hæmogregarines of lizards and snakes are often placed under the subgenus (or genus) *Karyolysus*

LYGOSOMA (HINULIA) TÆNIOLATUM, White (a skink).

a *Trypanosoma* sp., J. and C., 1911*a* (S.Q.)
Hæmogregarina sp., J. and C., 1911*a* (S.Q.).

TILIQUA SCINCOIDES, White (blue-tongued lizard).

b *Mesocœlium microon*, Nicoll, 1914*a* (N.Q.).
Tetracotyle tiliquæ, Nicoll, 1914*a* (N.Q.).

d lung nematodes—described and figured by Breinl, 1913*d* (N.Q.). I have met with the same species in this host in Sydney district (N.S. Wales), and in the vicinity of Brisbane. The parasite was not named by Dr. Breinl, who, however, drew attention to certain anatomical peculiarities of the nematode, and thought that it belonged to a new genus. As a result of an examination of my specimens, I agree with him. It is proposed to name the parasite *Pneumonema tiliquæ* n. gen., n. sp. I hope to be able to definitely classify it later.

OEDURA TRYONI, De Vis (Tryon's gecko).

a *Hæmogregarina* sp., Jnstn., 1911*f* (Burnett R.).
Hæmocystidium sp., Jnstn. 1911*f* (Burnett R.).

LIALIS BURTONII, Gray (Burton's slow worm).

c *Acanthotænia striata*, Jnstn., 1914 (N.Q.).

DELMA FRAZERI, Gray (Frazer's slow worm).

b *Eurytrema crucifer*, Nicoll, 1914*a* (N.Q.).

OPHIDIA.

PYTHON AMETHYSTINUS, Schn. (Northern Queensland carpet snake).

a *Hæmogregarina amethystina*, Jnstn., 1909*b*, 1910*a* (Port Curtis).
= *H. pythonis*, Bill., Jnstn., 1911*f*.

PYTHON SPILOTES var. VARIEGATUS, Gray (the common carpet snake).

a *Hæmogregarina shattocki*, Lamb., Jnstn., 1909*d*, 1910*a* (Brisbane); J and C., 1911*a*; C. and J., 1912*a* (Burnett); = *H. pythonis*, Billet —Jnstn., 1911*f*.

b *Dolichopera parvula*, Nicoll, 1914*a* (N.Q.).

c *Sparganum* sp., Jnstn., 1911*f*. (S.Q.).
Acanthotænia sp., Jnstn., 1914 (N.Q.)

d *Ascaris* sp., Jnstn., 1911*f* (S.Q.).

ASPIDIOTES RAMSAYI, Macleay (a western python).
c *Ophiotænia longmani*, Jnstn., 1916*a* (W.Q.).
d *Ascaris* sp., Jnstn., 1916*a* (W.Q.).
e *Porocephalus* sp., Jnstn., 1916*a* (W Q.).

DENDROPHIS PUNCTULATUS, Gray (green tree-snake).
a *Hæmogregarina dendrophidis**, J. and C., 1910*c*; C. and J., 1912*a* (S.Q.).
c *Sparganum* sp., Jnstn., 1911*f* (S.Q.).

DIPSADOMORPHUS FUSCUS, Gray (brown tree-snake).
a *Hæmogregarina* sp., Breinl, 1913*c* (N.Q.).
d *Agamonema* sp., (larval-encysted)—Brisbane, (Coll. H. A. Longman), Jnstn., 1916*c*.
Echinorhynchus sp. (larval-encysted)—Brisbane (Coll. H. A. Longman), Jnstn., 1916*c*.

FURINA OCCIPITALIS, D. and B. (ringed snake).
d *Diaphanocephalus* sp., Jnstn., 1911*f* (S.Q.).

DIEMENIA TEXTILIS, D. and B. (brown snake).
a *Trypanosoma* sp., Tyrie and Love, 1906 (N.Q.).
c *Sparganum* sp., Jnstn., 1913 (N.Q.).
d *Echinorhynchus* sp., Jnstn., 1916—larvæ forms in peritoneum and mesenteries (Brisbane).

PSEUDECHIS AUSTRALIS, Gray (a black snake).
a *Hæmogregarina bancrofti*, J. and C., 1911*a*; C. and J., 1912*a* (S.Q.).
c *Sparganum* sp., Jnstn., 1911*f* (S.Q.).
Acanthotænia gallardi, Jnstn., 1911*f*; 1912*b* (S.Q.).

PSEUDECHIS MORETONENSIS, De Vis (orange-bellied brown snake).
a *Hæmogregarina bancrofti*, J. and C, 1911*a* (S.Q.).

AMPHIBIA.

HYLA CÆRULEA, White (the common green frog).
a *Hæmogregarina* (*Lankesterella*) *hylæ*, C. and J., Clel., 1915*a* (Burnett R.)—very common in Brisbane district (Jnstn., 1916).
Balantidium, sp.—apparently uncommon (Brisbane).

---

* *Hæm. calligasger*, Lewis, *l.c.*, p. 34, from *Dendrophis calligasger* (a misprint for *calligaster*) from the Northern Territory is apparently a synonym; whilst his *H. darwinensis* from *Pseudechis darwinensis* (p. 34), looks like *H. pseudechis*, Jnstn. P.L.S., N.S.W., 34, 1909, p. 406.

Nyctotherus spp.—common (Brisbane).
Opalina spp.—common (Brisbane).
Amœba sp., aff. *A. limax* (Brisbane).
Trichomastix sp. (Brisbane).

b *Mesocœlium microon*, Nicoll, 1914*a* (N.Q.).
Mesocœlium mesembrinum, S.J.J., Jnstn., 1916*c* (Brisbane).
Dolichosaccus ischyrus, S.J.J., Jnstn., 1914*b* (Brisbane).
Diplodiscus megalochrus, S.J.J., Jnstn., 1916*c* (Brisbane). Now recorded from this host for the first time.

c *Sparganum* spp. (at least two types), Jnstn., 1911*f* (Burnett R.); 1912*b* (S.Q.).

d *Agamonema* sp., Jnstn., 1914*c* (Brisbane).
Rhabdonema sp. (lung worm), Jnstn., 1916*c* (Brisbane).
Echinorhynchus hylæ, Jnstn., 1914*c* (Brisbane).

HYLA GRACILENTA, Peters.

b *Mesocœlium microon*, Nicoll, 1914*a* (N.Q.).

HYLA LESUEURII, D. and B.

a *Trypanosoma* sp., Bancroft in Clel. and Jnstn., 1910*c* (Brisbane).

HYLA NASUTA, Gray.

a *Trypanosoma* sp., Bancroft, 1891, and in Clel. and Jnstn., 1910*c* (Brisbane).

LYMNODYNASTES TASMANIENSIS, Gunther.

a *Trypanosoma rotatorium*, Mayer, Clel. and Jnstn, 1910*c*; 1912*a* (S.Q.).
I now consider that this species should be separated from the European one, and suggest that it be associated with the name of my former colleague in parasitological work, Dr. J. B. Cleland = *Trypanosoma clelandi*, Jnstn., nom. nov.

LYMNODYNASTES ORNATUS, Gray (?).

a *Trypanosoma rotatorium*, Mayer, C. and J., 1910*c*; 1912*a* (S.Q.) = *Tryp. clelandi*, Jnstn., 1916 (see above).

PISCES.

ELASMOBRANCHII.

DASYBATIS KUHLII, M. and H. (spotted ray).
b *Petalodistomum polycladum*, S. J. Jnstn., 1913 (N.Q.).
Petalodistomum cymatodes, S. J. Jnstn., 1913 (N.Q.).

TELEOSTEI.

COPIDOGLANIS (TANDANUS) TANDANUS, Mitchell (fresh-water catfish).
a *Trypanosoma bancrofti*, J. and C., 1910*b*; C. and J., 1912*a* (SQ.)
b *Isoparorchis* sp., Jnstn, 1914*b* (Condamine R.).
I have since received many specimens taken from the swim bladder of this host from the Burnett River (Eidsvold), and the Dee River, by Dr. T. L. Bancroft.

ANGUILLA MAURITANA, Bennett (marbled eel).
a *Trypanosoma anguillicola*, J. and C., 1910*b*; C. and J., 1912*a* (Burnett R.).

ANGUILLA REINHARDTII, Steind (long finned eel).
a *Trypanosoma anguillicola*, J. and C., 1910*b*; C. and J., 1912*a* (S.Q.).

EELS:—Nicoll, 1914*d* mentions the occurrence of Filariæ in the body cavity (N.Q.).

MURÆNESOX CINEREUS, Forsk. (Pike eel).
b *Ectenurus angusticanda*, Nicoll, 1915*a* (N.Q.).

SAURIDA UNDOSQUAMIS, Richdsn. (the grinner, lizard fish).
Tetrarhynchus (larval) from mesentery, Jnstn, 1916 (Moreton Bay).

SERIOLA LALANDI, Cuv. and Val.—according to Mr. Ogilby, the fish referred to should be called *S grandis,* Cast.—king fish).
c *Tetrarhynchus* (*Anthocephalus*) sp., Jnstn., 1914*a* (N.Q.); 1916*c* (Masthead I.)
d *Filaria*, Nicoll, 1914*d* (N.Q.).

CARANX NOBILIS, Macleay (= *C. georgianus*, C. and V., according to Mr. J. D. Ogilby—white trevally).
Bucephalopsis exilis, Nicoll, 1915*a* (N.Q.).

POMADASIS HASTA, Bloch (Javelin fish).
b *Æphnidiogenes barbarus*, Nicoll, 1915*a* (N.Q.).
Genolopa trifolifer, Nicoll, 1915*a* (N.Q.).
Genolopa cacuminata, Nicoll, 1915*a* (N.Q.).
Sterrhurus brevicirrus, Nicoll, 1915*a* (N.Q.).

SPARUS BERDA Forsk (syn. *Chrysophrys hasta* Bl., a sea bream).
c *Tetrarhynchus* (*Anthocephalus*) sp., Jnstn., 1914*a* (N.Q.).

SPARUS AUSTRALIS, Gunther (black bream).
b *Coitocæcum gymnophallum*, Nicoll, 1915*a* (N.Q.).
Xenopera insolita, Nicoll, 1915*a* (N.Q.).
d *Echinorhynch* :—Nicoll, 1914*d* (N.Q.).
Filaria sp., peritoneum, Jnstn., 1916 (Moreton Bay).

TACHYSURUS sp. (pilot fish).
b *Gyliauchen tarachodes*, Nicoll, 1915*a* (N.Q.).

SPHÆROIDES LUNARIS, Schn. (a toadfish).
b *Opistholebes amplicœlus*, Nicoll, 1915*a* (N.Q.).

SPHÆROIDES MULTISTRIATUS, Richdsn. (spotted toadfish).
b *Maculifer subæquiporus*, Nicoll, 1915*a* (N.Q.).

TETRAODON HISPIDUM var. (spotted toadfish).
b *Steringotrema pulchrum*, S. J. Jnstn., 1913 (N.Q.).

TETRAODON HISPIDUM, L.
b *Steringotrema pulchrum*, S. J. Jnstn., 1913 (N.Q.)

TOADFISHES.
Nicoll (1914*d*) refers to the presence of filariæ in the body cavity (N.Q.).

DIPNOI.

CERATODUS (NEOCERATODUS) FORSTERI, Krefft. (Ceratodus, Queensland lung fish, Burnett River salmon).
b *Amphistoma* sp., Jnstn., 1912*b* (Burnett R.).
d *Amblyonema terdentatum*, Linstow, 1898 ; Jnstn.,1912*b* (Burnett R.).
Ascaris sp., Krefft., 1871, is almost certainly the same as the preceding species.

ARTHROPODA.

ARACHNIDA (ACARIDA)

ARGAS PERSICUS Wald. (Syn. A. AMERICANA Pack.)—(the fowl tick).

a. *Spirochaete* (*Spiroschaudinnia*) *gallinarum* the parasite of fowl tick-fever. Dodd 1909 (N.Q).—(see also under "Fowl" (GALLUS DOMESTICUS.)

BOOPHILUS AUSTRALIS, Fuller (*the* cattle tick)

a *Babesia bigeminum*, K. and S., the correct name is probably *B. bovis*, though the organism is generally known in Queensland as *Piroplasma bigeminum*, the cattle tick-fever parasite. For general references to this hæmatozoon, see under "Ox."

BOOPHILUS ANNULATUS var., MICROPLUS, Canestr. (cattle tick).

a *Babesia bigeminum*, Kilb. and Smith; Gilruth, 1912 (Qld.).

APONOMMA TRIMACULATUM, Lucas.

a *Hæmogregarina varanicola*, J. and C., in intestine, and probably transmitted by this tick; Breinl, 1913*c* (N.Q.).

APONOMMA spp.

The various hæmatozoa of lizards and snakes are no doubt transmitted mainly by species of *Aponomma*, which are common on these hosts in this State, and are found occasionally on mammals.

INSECTA.

ORTHOPTERA.

PERIPLANETA AMERICANA, L. (the introduced house cockroach).

d *Oxyuris* sp., Jnstn., 1916*c* (Brisbane).

PERIPLANETA AUSTRALASIÆ, Fabr. (house cockroach).

a *Nyctotherus* sp., found by Mr. C. D. Gillies and myself (Brisbane).

d *Oxyuris* sp., Jnstn., 1916*c* (Brisbane).

COLEOPTERA.

CACACHROA DECORTICATA, Macleay (a cane beetle).

d *Thelastomum alatum*, Jnstn., 1914*c* (Cairns)

APHANIPTERA

The presence of the cysticercoid stage of *Dipylidium caninum* L. (a tapeworm, which infests cats and dogs in Queensland) in the cat flea and dog flea (*Ctenocephalus felis* and *C. canis* respectively), may be inferred. Likewise also the cysticercoid of *Hymenolepis diminuta* of rats, in *Ceratophyllus fasciatus*, one of the rat fleas. The lastnamed ectozoon is also known to be the chief transmitter of *Trypanosoma lewisi*, which is a blood parasite of local rats.

DIPTERA.

MUSCA DOMESTICA L. (common house fly).

a *Leptomonas* (*Herpetomonas*) *muscæ-domesticæ*, Burnett, Jnstn., 1916*c* (Brisbane, also in Sydney, N.S.W.).

d *Habronema muscæ*, Carter; Jnstn., 1912*b* (Brisbane).

MUSCA VETUSTISSIMA, Walker (cattle fly).

d *Habronema muscæ*, Carter ? Jnstn., 1912*b* (S.Q.).

Habronema sp., Tryon, 1914, the same as the preceding.

CALLIPHORA OCEANIÆ, Desv. (a common blow fly).

a *Leptomonas* (*Herpetomonas*) *muscæ-domesticæ*, Burnett. Jnstn., 1916*c* (Brisbane).

According to Dr. Cleland (Trans. Int. Med. Congr. Austr. 1913, p. 566), the correct name of the blowfly known here as *C. oceanica* is *Anastellorhina augur* Fabr.

CALLIPHORA VILLOSA, Desv. (a blow-fly).

a *Leptomonas* (*Herpetomonas*) *muscæ-domesticæ*, Burnett, Jnstn., 1916*c* (Brisbane).

According to Dr. Cleland (*l.c.*, p. 550), the blow-fly identified as *C. villosa* is really *Pollenia stygia*, Fabr.

CULEX FATIGANS, Wied. (syn *C. skusii*, Giles), common house mosquito.

The organism of *dengue* is transmitted by this mosquito.

Dirofilaria immitis, Leidy (heart worm of the dog).* Bancroft, 1893, 1898, 1900, 1901*a*, 1903*a*, 1903*b*.

---

*Dr. G. Sweet (1908, p. 485), has misquoted Bancroft, 1901*a*, in reference to *Anopheles maculipennis* as the intermediate host of *Dirofilaria immitis* in Queensland. Bancroft states definitely (p. 43, 1901), that this mosquito does not occur in Australia (1903, p. 251).

Filaria bancrofti, Cobbold (human), Bancroft, 1903*a*.

CULEX CILIARIS, Skuse, *nec* Linn = *C. fatigans*.

Filaria bancrofti, Cobb., Bancroft, 1898, 1899*a*, 1899*b*.

CULICELSA ANNULIROSTRIS, Skuse.

Filaria bancrofti, Cobbold, Bancroft, 1899*a*.

SCUTOMYIA NOTOSCRIPTA, Skuse.

Filaria bancrofti, Cobb., Bancroft, 1899*a*. O'Brien (1908) believes this mosquito to be the carrier of dengue in North Queensland.

CULICELSA VIGILAX, Skuse—the black bush mosquito.

Filaria bancrofti, Cobb., Bancroft, 1898.

As far as I am aware, no work other than that of Dr. T. L. Bancroft has been published regarding the transmission of parasites by mosquitoes in Australia Human malaria is transmitted by Anophelines; Castellani and Chalmers (Man. Trop. Med., p. 854), mention, however, but on what authority I do not know, that *Nyssorhynchus* (= *Anopheles*) *annulipes*, Walker, is known to be a carrier in Australia. This mosquito which occurs in Australia* has been proved by Kinoshita† to be a transmitter in Formosa.

---

*T. L. Bancroft. List of the mosquitoes of Queensland. Ann. Queensland Museum, No. 8, 1908; J. B. Cleland. List of the mosquitoes recorded in Australia. Rep. Bur. Microbiol, N.S.W. (1910-11), 2, 1912, pp. 143-5., and in Trans. Intercol. Med. Congr. Austr. 9 (1), 1911 (1913), pp. 553-5; F. Taylor. Descriptions of mosquitoes collected in the Northern Territory during the expeditions of 1911. Bull. North Territory, No. 1*a*, 1912, pp. 25-34; A. Breinl, 1912, p. 18, 23; L. Cooling, Report on mosquito work in Brisbane, in Rep. Commiss. Public Health, Queensland, 1914, pp. 56-64; E. Ferguson. Notes on mosquitoes, Ann. Rep. Govt. Bur. Microbiology, N.S.W., 4, 1915, p. 238.

A. Breinl and M. J. Holmes in their "Medieal Report on the data collected during a journey through some districts of the Northern Territory" (Bull. North. Terr., No. 15, Dec., 1915) state that "the mosquito which in all probability carries the malarial parasite in N.T. is *Nyssorhynchus annulipes*. . ." (p. 5.).

Since writing the above I have come across a reference by Breinl (1915) who in writing of this mosquito calls it the carrier of malaria. This statement is not based on experiment, but only on general grounds. As far as I am aware no species of mosquito has yet been proved to be a carrier of any form of malaria parasite, *Plasmodium*, *Proteosoma*, *Hæmoproteus*, etc., in Australia.

†Kinoshita. Arch. F. Schiffs, u. Tropenhyg, 10, p. 708. This reference, as well as some that follow, have been kindly supplied by Mr. F. H. Taylor, of the Tropical Institute, Townsville.

MOSQUITOES.

Bird malaria, *Plasmodium* (*Proteosoma*) spp. is transmitted elsewhere, as far as known, by species of culicine mosquitoes (Minchin. Intr. Study Protozoa, 1912, p. 358), including *Stegomyia fasciata* (p. 364) (=*S. calopus*), which is common in Eastern Queensland.

In reference to *Halteridum* (*Hæmoproteus*), which is so common in Queensland birds, Minchin states (*l.c.*, p. 357), that the invertebrate host, so far as known, is a Hippoboscid fly, but as these are very uncommon on our native birds, especially the passerines, one is led to believe that in Australia, as least, some other group of Diptera must act as transmitters, *e.g.*, some mosquito, probably a Culicine.

In regard to the reptilian *Hæmocystium* parasites, the carrier in the case of the tortoises is no doubt a freshwater leech, some of which occur ectoparasitically on Queensland species of *Chelodina* and *Emydura*, whilst in the case of lizards it may be a mosquito, or perhaps a tick.

Dr. Bancroft did good work in tracing the life history of the filarial worm, with which his father's name is associated (*F. bancrofti*, Cobbold). Theobald has given a formidable list of mosquitoes both Culicine and Anopheline which can act as transmitters. (Castellani and Chalmers Man. Trop. Med., p. 666, 1126). Amongst them are some occurring in Queensland, *e.g.*, *Tæniorhynchus* (*Mansonia, Mansonoides*), *uniformis*, Theob.; *Anopheles annulipes*, etc. Perhaps *Stegomyia calopus* (*S. fasciata*) may also do so,* since *S. pseudoscutellaris*, Theob., is a transmitter in Fiji† and probably also in New Guinea, where it occurs too (Brienl, 1915).

Dirofilaria immitis is carried by *Anopheles* sp. in Europe (Manson, Trop. Diseases, p. 564). Bancroft has found that at least one Culicine species, *C. fatigans* (*C. skusii*) can transmit it in Queensland.

We do not yet know the carriers (probably mosquitoes) of the various species of filarial worms so commonly parasitic in Queensland birds, and to a much less extent, in marsupials.

---

*Theobald. Monogr. Culicidæ of the World, 1, p. 293, quotes this as a host.

†Bahr. Filariasis, etc., in Fiji.

Stegomyia fasciata (syn. *S. calopus*) is perhaps a transmitter of dengue (Manson. Edit. 5, 1914, p. 272).

HEMIPTERA.

Amongst the Hemiptera, the rat louse, *Hæmatopinus (Polyplax) spinulosus*, is known* to be a carrier of *Trypanosoma lewisi*, Kent, which parasitises the blood of rats in Australia and elsewhere.

MOLLUSCA.

Amongst the molluscs, various developmental stages of Trematodes and Cestodes must occur, but their presence has not been reported.

ANNULATA.

Leeches, no doubt, serve as intermediate hosts of the Trypanosomes, Hæmogregarines and Hæmocystidium occurring in fresh water tortoises and the trypanosomes of our eels, catfishes and frogs.

Hæmogregarina (*Lankesterella*) *hylæ* of the green frog, *Hyla cœrulea*, is probably transmitted by a freshwater leech during the aquatic stage of the host.

Entomostraca certainly serve as the intermediate host of many of the Cestodes infesting our birds. No doubt some of the Oliogochætes do also.

Various Nematomorpha frequent our fresh waters, but none have been described either in the parasitic or in the free living stage except *Parachordodes annulatus*, Linstow, 1906. I have mentioned the presence of *Gordius* sp. (free form) at Montville (T.H.J., P.R.S., Q. 27 (2), 1915, p. iv. Tryon, 1911, p. 73; 1912, p.100, has also referred to its occurrence in several localities (Eudlo, Beaudesert, Rockhampton).

I desire to express my thanks to Messrs. Longman and Ogilby†, of the Queensland Museum, for assistance in regard to the names of some of the hosts.

---

*E. Rodenwaldt. *Trypanosoma lewisi* in *Hæmatopinus spinulosus*, Centr. Bakt., 1, Orig., 52, 1909, p. 30-42.

†J. D. Ogilby. The Commercial Fishes and Fisheries of Queensland. An essay. Govt. Printer, Brisbane, 1916.

LITERATURE.*

This list contains only such papers as refer to the presence of entozoa in this State.

L. N. Ashworth.

1895 (Exhibit of Ankylostomes). Austr. Med. Gaz., 14, 1895, p. 456.

1896 A case of Ankylostomiasis complicated by the presence of another small worm. *Ibid*, 15, 1896, p. 482-5.

W. Bacot.

1892 Cases of earth-eating in North Queensland. A. Med. Gaz., 11, 1892, p. 430.

J. Bancroft.

1876 Letter in Cobbold. 1876.

1878 Cases of filarious disease. Trans. Path. Soc. Lond., 29, 1878, p. 407-17.

1879*a* Letters to Cobbold in Cobbold, 1879*a*, 1879*b*.

1879*b* New cases of filarious disease. Lancet, 1, 1879, p. 698.

1880 Further notes on a case of leprosy associated with *Filaria*. Lancet, 1, 1880, p. 285-6.

1882*a* Austr. Med. Gaz., 1882, p. 170.

1882*b* Ibid, 1882, p. 361.

1885 *Scleroderma* in relation to *Filaria sanguinis hominis*. Lancet, 1, 1885, p. 380.

1889 On *Filaria*. Trans. Intercol. Med. Congr. Austr., 2, 1889, p. 49-54—abstracted in Medical News, Philad., 56, 1890, p. 656.

1892 Leprosy in Queensland. A. Med. Gaz., 11, 1892, p. 427-30, and in Trans. Int. Med. Congr. Austr., 3, 1892, p. 622-6.

T. L. Bancroft.

1888 Note on *Hæmatomonas* in rats' blood. Proc. Roy. Soc. Q., 5, 1888, p. 31-2.

1889 On Filariæ of birds. *Ib.*, 6 (1) 1889. p. 58-62.

1890 *Echinococcus* in the lung of a wallaby. *Ib.*, 7, 1890, p. 31.

1891 (Exhibits). *Ib.*, 8, 1890 1, p. xiii., xiv.

1893*a* Notes on some diseases of stock in Queensland in Rep. Chief Insp. Stock Dept. Agric., Q'land, 1892 (1893). Appendix 4. And abstract in Vet. Jour. and Ann. Comp. Path. Lond., 37, 1894. pp. 327 330; and as "worm diseases in sheep and oxen in Queensland," Vet. Mag., Philad., 1, (3), 1894, p. 220-1.

1893*b* On the whip-worm of the rat's liver. P.R.S., N.S.W., 27, 1893, p. 86-90.

1893 Entozoal parasites. A. Med. Gaz., 12, 1893, p. 258-60.

1893*d* Discussion on Jackson's paper (1893), p. 262.

1898 Metamorphosis of *Filaria sanguinis hominis*. A. Med. Gaz., 17, 1898, p. 271.

---

*The literature prior to 1909 dealing with the occurrence of hydatids in Queensland is referred to in Johnston 1909*c* and 1910*d*.

1899*a* On the Metamorphosis of the young form of *Filaria bancrofti*, Cobbold, in the body of *Culex ciliaris*, etc., P.R.S., N.S.W., 33, 1899, p. 48-62.

1899*b* Filarial Metamorphosis in the mosquito. *Ibid*, 18, 1899, p. 120.

1899*c* Same as 1899*b*. *Ibid*, 2, 1899, p. 91-4. This paper has been abstracted in Med. Record, N. York, 57, 1900. p. 248; in Arch. d. Med. Nav., Paris, 77, 1902, p. 145-7.

1900 Part of 1899*b*. Jour. Trop. Med.. Lond., 2, 1899-1900, p. 149-153.

1901*a* Preliminary note on the intermediary host of *Filaria immitis*, P.R.S., N.S.W., 35, 1901, p. 41-6.

1901*b* Ditto in Jour. Trop. Med. Lond., 4, 1901. p. 347-9.

1902 On the probable way by which the young *Ankylostoma duodenale* enters the human subject. A. Med. Gaz., 21, 1902, p. 66—abstracted as "Uncinariosis" in Jour. Amer. Med. Assoc., Chicago, 38, 1902. p. 973.

1903*a* Notes on *Filaria* and mosquitoes. A. Med. Gaz., 22, 1903, p. 251-2.

1903*b* On some further observations on the life history of *Filaria immitis*, P.R.S., N.S.W., 37, 1903, p. 254-7.

1912 On a proposed technique for the prevention of dengue fever and filariasis. A. Med. Gaz., 31, 1912, p. 80-1.

See also P. Bancroft, E. S. Jackson and T. L. Bancroft.

P. BANCROFT.

1893 (Discussion on Jackson, 1893). A. Med. Gaz., 1893.

1908 (Discussion on Jackson, 1908). *Ibid*, 1893.

1910 Notes on filaria in Queensland. *Ibid*, 1910, p. 233-4.

P. BANCROFT, E. S. JACKSON, T. L. BANCROFT.

1894 Notes on the increase of white corpuscles in filarial blood. A. Med. Gaz., 1894, p. 6.

C. BARNARD and A. PARK.

1894 Notes on *Spiroptera* associated with tuberculosis. Rep. Austr. Assoc. Adv. Sci., 5, 1893 (1894), p. 642-5.

A. W. BARNES.

1896 Tick fever in Queensland. Vet. Jour. Ann. Comp. Path. Lond., 43, 1896, p. 300-3.

1898*a* A new cattle disease. *Ibid*, 47, 1898, p. 485-6.

1898*b* "Supposed new disease" in Ann. Rep. Dept. Agric., Q'land., 1897-8 (1898), p. 88-9. Same as 1898*a*.

W. G. BROWN.

1912, 1913 Reports in Rep. Dept. Agric. Stock, Q'land., 1912; 1913.

1913*a* The stomach worm in sheep. Q. Agr. Jour., 30, 1913, p .157-9.

1913*b* The sheep botfly. Q.A.J., 31. 1913, p. 356-7.

1914 The nasal fly (*Œstrus ovis*), Q.A.J. (n.s.), 1, 1914, p. 421-6.

1915 The stomach worm in sheep. Q.A.J. (n.s.), 4, 1915, p. 11-15; 71-3; 162-3.

A. BREINL.

1911 (Remarks.) A. Med. Gaz., 1911, p. 88-9.

1912 Report on Health and Disease in the Northern Territory. Bull. Northern Terr., 1*a*, July, 1912 (Melbourne).

1913*a* Investigation into the morphology and life history of *Onchocerca gibsoni*, etc. Rep. Austr. Inst. Trop. Medicine for 1911 (April, 1913), p. 5-17.

1913*b* On human filariasis in Queensland and the morphology of *Microfilaria bancrofti*. *Ibid.*, p. 18-23.

1913*c* Parasitic protozoa encountered in the blood of Australian Native Animals. *Ibid.*, p. 30-38.

1913*d* Nematodes observed in North Queensland. *Ibid.*, p. 39-46.

1913*e* The object and scope of Tropical Medicine in Australia. Trans. Intercol. Med. Congr. Austr., 9, 1911 (1913), I., p. 524-532.

1913*f* Ankylostomiasis. *Ibid*, 9, 1911 (1913), I., p. 536-541.

1915 The distribution and spread of diseases in the East. Med. Jour. Austr., 2, 1915, p. 547-52.

A. Breinl & H. Priestley.

1916*a* Malaria contracted in New Guinea by Members of the Expeditionary Force and its treatment. Med. Jour. Austr., 1, 1916, p. 91-5.

1916*b* Notes on the successful treatment of ulcerative granuloma pudendi by means of tartar emetic, *Ibid.*, p. 237-9.

Booth-Clarkson.

1913 Rep. Med. Inspector North Q'land., in Ann. Rep. Comm. Publ. Health, Q'ld., 1912-3 (1913)—Abstr. in A. Med. Gaz., 35, 1913, p. 191.)

A. G. Butler.

1912 Disease of Man spread by insects. A. Med. Gaz., 31, 1912, p. 177-86.

D. A. Cameron.

1913 Ankylostomiasis. A. Med. Gaz., 33, 1913, p. 285.

1916 A case of liver abscess. Med. Jour. Austr., Apr., 1916, p. 432-4.

C. & J.=Cleland and Johnston *q.v.*

J. B. Cleland.

1912 Some notes and suggestions in connection with the etiology of bovine onchocerciasis. A. Med. Gaz., 1912, p. 438-442.

1912*b* Bibliography of hydatid cysts of the pelvis and urinary organs. A. Med. Gaz., 31, 1912, p. 534-5.

1913 A contribution to the history of disease of man in Australia. Trans. Int. Med. Congr. Austr., 9, 1911 (1913), 1, p. 234-247.

1914*a* Further investigations into the etiology of worm nodules in cattle. Bull. Dept. Trade and Customs, Commonw. Govt., 1914.

1914*b* Same as 1914*a*. Rep. Bur. Microbiol., N.S.W., 3, 1912 (1914), p. 135-153.

1914*c* Contributions to a history of disease of man in Australia. *Ibid.*, 3, 1912 (1914), p. 226-238.

1915*a* The Hæmatozoa of Australian Batrachia No. 2, P.R.S., N.S.W., 48, 1914 (1915), p. 412-4.

1915*b* The Hæmatozoa of Australian Birds, No. 3. Trans. Roy. Soc., South Austr., 39, 1915, p. 25-37.

J. B. Cleland and T. H. Johnston. See also Johnston and Cleland.
1910*a* Worm nests in cattle due to *Filaria gibsoni*. Agric. Gazette, N.S. Wales, 21, 1910, p. 173-4.
1910*b* On worm nests in Australian cattle due to *Filaria* (*Onchocerca*) *gibsoni* with a note on similar structures in camels. P.R.S., N.S.W., 44, 1910, p. 156-171.
1910*c* The Hæmatozoa of Australian Batrachia No., 1, *Ibid.*, 44, 1910, p. 252-268.
1910*d* The Hæmatozoa of Australian Birds, No. 1. Trans. R.S., South Austr., 34, 1910, p. 100-114.
1910*e* Same as 1910*a*. Jour. Trop. Vet. Science (Calcutta), 5, 1910, p. 520-1.
1910*f* Protozoal infections (in Australia). Rep. Govt. Bureau of Microbiology, N.S.W., for 1909 (1910), p. 35-46.
1910*g* Worm nests in cattle and camels. Rep. Bur. Microbiology, N.S.W., 1909 (1910), p. 91-99.
1910*h* Worm nests in cattle due to *Filaria gibsoni*. Jour. Comp. Pathol. and Therap., London, 23, 1910, p. 335-353. (Same as 1910*g*).
1911*a* Same as 1910*a*. Jour. Meat and Milk Hygiene, London, 1, 1911, p. 21-23.
1911*b* Notes on worm nests in Australian Cattle and in Camels. Same as 1910*g*. Bulletin of Dept. Trade and Customs, Commonwealth of Australia (Melbourne).
1911c The Hæmatozoa of Australian Birds, No. 2. P.R.S., N.S.W., 45, 1911, p. 415-444.
1912*a* Species of Hæmoprotozoa met with during 1910-1911. Rep. Bur. Microbiol, N.S.W., for 1910-11 (1912), p. 74-83.
1912*b* Tabular statement of the Hæmatozoa occurring in wild and domesticated animals in Australia. *Ibid*, p. 83-88.
1912*c* Microfilariæ in the blood of Australian birds. *Ibid.*, p. 136-137 (is part of 1910*d*).
1912*d* The Helminth parasites of man in Australia (same as Johnston and Cleland, 1912*a*), *Ibid*, pp. 113-119.

N. A. Cobb.
1891 Parasites in the stomach of a cow. Agr. Gaz., N.S.W., 2, p. 614.

S. Cobbold.
1876 Verifications of recent hæmatozoal discoveries in Australia and Egypt. Brit. Med. Jour., 1, June, 1876, p. 780-1; and in Veterinarian, July, 1876, p. 487-9.
1877*a* Discovery of the adult representative of microscopic filariæ. Lancet, July, 1877, p. 70-1.
1877*b* On *Filaria bancrofti*. Lancet, Oct., 1877, p. 495-6.
1879 Filariæ and leprosy. Lancet, Feb., 1879, p. 175.
1880 Observations on Filariæ by Manson, J. Bancroft (and others). Jour. Queckett. Micr. Club, 1880, p. 58-64.

W. Collins (see Hunt and Collins).

A. H. Cory.
1912, 13, 14 In Ann. Rep. Dept. Agr., Q'land, 1912; 1913; 1914.

1910*a* Lung worms in calves. Q. Agr. Jour., 25, 1910, p. 198-200.
1910*b* Liverfluke. Q.A.J., 25, 1910, p. 297.

D. G. Croll.
1911 Some pathological notes on children. A. Med. Gaz., 1911, p. 585-6; p. 522.

S. Dodd. (See also Gilruth, Sweet and Dodd).
1908*a* Stomach or wireworms in sheep. Q.A.J., 21. 1908, p. 93-6.
1908*b* Notes on the presence of two stomach worms in calves hitherto unrecorded in Australia. Q.A.J., 21, 1908, p 197-8. (Same as 1909*b*).
1908*c* Tickfever or redwater. Q.A.J., 21, 1908, p. 245-251. (Same as 1909*a*).
1909 Reports in Rep. Dept. Agr., Q., 1908-9 (1909). p. 81-105; (*a*) Tickfever or redwater, p. 82-7; (*b*) stomach worms in sheep and calves, p. 93-4; (*c*) Tickfever or Spirochætosis of poultry in Queensland, p. 96-100; (*d*) Eye worms in poultry, p. 100-1; (*e*) Sarcosporidiosis, p. 101.
1910*a* "*Spiroptera reticulata*"; "*Spiroptera reticulata*" in cattle—(two letters). Q.A.J., 24, 1910, p. 85; 86-7.
1910*b* Reprint of 1910*a*. Jour. Trop. Vet. Sci., 5, 1910, p. 518.
1910*c* (Same as 1909*c*). Jour. Comp. Path. Therap., 23, 1910, p. 1.
1910*d* (Same as 1909*a*). Jour. Comp. Path., 23, 1910, p. 141-160.
1910*e* "Diseases in Stock" (a letter). Rep. Dept. Agr., Q., 1909-10 (1910), p. 19-22.
1914. Reprint of 1908*a*. Q.A.J. (n.s.), 1, 1914, p. 421-6.

J. S. C. Elkington. (See also Harris and Elkington.)
1910, 11, 12 Ann. Rep. Commissioner Publ. Health, Q'land, 1909-10 (1910); 1910-11 (1911); 1911-12 (1912).
1911*b* (Remarks). A. Med. Gaz., 30, 1911, p. 88.
1912*b* Abstract of 1912. A Med. Gaz., 31, 1912, p. 280-4.
1912*c* The value of the laboratory worker to the profession. A. Med. Gaz., 32, 1912, p. 349-51.

J. Flynn.
1903 Notes on Filariasis. A. Med. Gaz., 1903, p. 248-51.

C. Fuller.
1896 The bovine tickfever. Agr. Gaz., N.S.W., 7. 1896, p. 760-787.
1899 Notes on the Queensland Cattle tick. etc. Q.A.J., 4, 1899, p. 389-94.

J. Gibson.
1892 Notes on certain worm nests or worm knots occurring in the cellular tissues of the brisket in cattle. Trans. Int. Med. Congr. Austr., 3, 1892, p. 576-80.

L. Gibson.
1892 (A case of anæmia from Ankylostome infection). A. Med. Gaz., 11, 1892, p. 440-1.

L. Gibson and A. J. Turner.
1892 Notes on the occurrence of *Ank. duodenale* in Q'land. Trans. Int. Med. Congr. Austr., 3, 1892, p. 134-7.

J. A. GILRUTH.

1912 The introduction and spread of the cattle tick (*Boophilus annulatus* var. *microplus*), and of the associated disease, tickfever (Babesiasis) in Australia. P.R.S., Vic., 25. 1912, p. 15-22; reprinted in Q. Agr. Jour., 29, 1912, p. 351-7.

J. A. GILRUTH AND G. SWEET.

1911 *Onchocerca gibsoni*, the cause of worm nodules in Australian cattle. Bull. Dept. Trade and Customs, Commonwealth Govt., 1911.

1912*a* Ditto. Rep. A. A. Adv. Sci., 13, 1912, p. 316-345.

1912*b* Further observations on *Onchocerca gibsoni*, the cause of worm nodules in cattle. P.R.S., Vic., 25, 1912, p. 23-30. Reprinted in Q.A.J., 29, 1912, p. 351-7.

J. A. GILRUTH, G. SWEET AND S. DODD.

1911 Observations on the occurrence in the blood of various animals of bodies apparently identical with *Anaplasma marginale*, Theiler, 1910. Parasitology, 4, 1911, p. 1-6.

P. R. GORDON.

1898-1903 In Ann. Rep. Dept. Agr. Stock Q. 1898, 1899, 1901, 1903.

P. R. GORDON AND C. J. POUND.

1897 Inoculation for tick fever. Veterinarian, Sept., 1897, p. 535-43.

A. C. HALFORD.

1898 (Note on the occurrence of *Trichina spiralis*). Aust. Med. Gaz., 1898, p. 263.

1909 (On a case of *Ank. duodenale*). *Ibid.*, 1909, p. 391.

DR. HAM.

1909 Ann. Rep. Comm. Publ. Health, Q'land, 1908-9 (1909).

G. HANCOCK.

1911 Report on the examination of Queensland beef in the Port of London for the presence of *Spiroptera reticulata*. Jour. Meat and Milk Hyg., 1, 1911, p. 24-6.

D. HARDIE.

1897 (Exhibit of hookworm patient). *Ibid.*, 1897, p. 354.

J. J. HARRIS AND J. S. ELKINGTON.

1912 Reduction and destruction of disease-bearing insects. A Med. Gaz., 1912, p. 427-34.

J. B. HOGG.

1889*a* The whip worm as a probable cause of dysentery. Aust. Med. Gaz., 8, 1888-9, p. 60-1.

1889*b* (Exhibit). *Ibid.*, 1889, p. 92.

1889*c* A case of death from anæmia due to *Ankylostoma doudenale*. *Ibid.*, 1889, p. 133-4; Brit. Med. Jour., 1889, p. 792.

HOGGAN.

1892 (Exhibit of Filarial patient.) A.M.G., 1892, p. 416.

J. S. HUNT.

1897*a* Inoculations for tick fever. Q. Agr. Jour., 1, 1897, p. 404-411.

1897*b* Progress Report, printed as "The tick trouble." Q.A.J., 1, 1897, p. 104-6.

1897*c* The tick trouble. Vet. Jour. Ann. Comp. Path. Lond., 45, 1897, p. 231-3.

1898*a* Progress report on the reproductive forms of the micro-organism of tick fever, etc. Q.A.J., 2, 1898, p. 211-220.

1898*b* Brief summary of the results of the investigations in connection with protective inoculation against tick fever. Rep. Dept. Agr. Stock, Q., 1897-8 (1898), p. 87-8.

1898*c* Tick fever. Q.A.J., 3, 1898, p. 235-8.

1898*d* Notes on the natural history and prevention of Texas fever. Q.A.J., 3, 1898, p. 446-456.

1899*a* Texas fever. Q.A.J., 4, 1899, p. 216-220.

1899*b* Report on investigations regarding Texas fever. Rep. Dept. Agr., Q., 1898-9 (1899), p. 115-120.

J. S. HUNT AND W. COLLINS.

1896 Report on tick fever. Govt. Printer, Brisbane.

1897 Tick fever in Queensland. (Abstract of 1896). J. Comp. Path. Therap., 10, 1897, p. 88-96.

J. & C. = JOHNSTON AND CLELAND, *q. v.*

E. S. JACKSON—see also P. Bancroft and E. S. Jackson.

1893 What effect has *Filaria sanguinis hominis* upon its human host in Queensland A. Med. Gaz., 1893, p. 260-1.

1908 The manifestations of filariasis as it appears in Queensland. *Ibid.*, 1908, p. 344.

1909 (Notes on Filaria). *Ibid.*, 28, 1909, p. 444.

1910 Notes on Filaria in Queensland—chiefly historical. *Ibid.* 1910, p. 231-3.

1911 Notes on ulcerative granuloma. A Med. Gaz., 1911, p. 133-6.

1913 Mosquito-borne disease in Queensland. Trans. Int. Med. Congr. Austr., 9, 1911 (1913), 1, p. 604-8.

E. JARVIS.

1913 Rep. Entomologist in Rep. Dept. Agr. Q'land, 1912-13 1913).

T. HARVEY JOHNSTON.

1909*a* Notes on some Australian Parasites. Agric. Gaz., N.S.W., 20, 1909, p. 581-4.

1909*b* On a new hæmoprotozoon. Rec. Austr. Museum, 7, 1909, p. 257-9.

1909*c* Notes on Australian Entozoa. *Ibid.*, 7, 1909, p. 329-344.

1909*d* On some Hæmogregarines from Australian Reptiles. P.L.S., N.S.W., 34, 1909, p. 400-410.

1909*e* The Entozoa of Australian Monotremata and Marsupialia No. I. *Ibid.* 34, 1909, p. 514-523.

1909*f* Notes and Exhibits. P. Roy. Soc., N.S.W., 43, 1909, Abstract p. xv., etc.

1909*g* On the role of water in the spread of human helminthiasis. A. Med. Gaz., 1909, p. 479-481.

1910*a* Hæmogregarinidæ. Rep. Govt. Bureau of Microbiology, N.S.W., for 1909 (1910), p. 41-44.

1910*b* List of Entozoa, recorded as occurring in man and the domesticated animals and birds in Australia. *Loc. cit.*, p. 74-81.

1910*c* Description of certain parasites met with during the year. *Loc cit.*, p. 82-89.

1910*d* Same as 1909*c*. Jour. Trop. Vet. Sci., 5, 1911, p. 353-7.

1910*e* Same as 1909*a*. *Ibid*, 5. 1911, p. 349-353.

1910*f* Notes and Exhibits. P.L.S., N.S.W., pp. 28, 309, 310, 522, 523, 659, 660, 804.

1910*g* On Australian Avian entozoa. P.R.S., N.S.W., 44, 1910, p. 84-122.

1910*h* Notes and Exhibits. *Ibid.*, 44, 1910, pp. xi-xiv., xvii.

1911*a* The Entozoa of Australian Marsupialia, No. 2. P.L.S., N.S.W., 36, 1911, p. 47-57.

1911*b* On the occurrence of worm nests in Queensland Cattle—a summary. P.R.S., Q., 23, 1911, p. 207-231.

1911*c* A census of Australian Reptilian Entozoa. *Ibid.*, 23, 1911, p. 233-249.

1911*d* A brief account of the worm nodules occurring in cattle. Q'land Agr. Jour., 1911, p. 309-311.

1912*a* A re-examination of Krefft's types of Entozoa. Rec. Austr. Museum, 9, 1912, p. 1-36.

1912*b* Notes on some Entozoa. P.R.S., Q., 24, 1912, p. 63-91.

1912*c* The internal parasites recorded from Australian birds. Emu 12, Oct., 1912, p. 105-112.

1912*d* New Species of Cestoda from Australian Birds. Mem. Q'land, Museum, 1, 1912, p. 211-214.

1912*e* Australian Avian entozoa—same as 1910*g*. Rep. Bur. Microbiology, N.S.W., for 1910-1911 (1912), p. 122-136.

1913 Report on the Cestoda and Acanthocephala. Rep. Austr. Instit. Trop. Medicine, Townsville, for 1911 (April, 1913), p. 75-96.

1914*a* Second report on the Cestoda and Acanthocephala collected in Queensland. Ann. Trop. Med. and Parasitology (Liverpool), 8, 1914, p. 105-112.

1914*b* Notes and Exhibits—Trematoda. P.R.S., Q., 26, 1914, p. 69.

1914*c* Some New Queensland Endoparasites. *Ibid.*, 26, 1914, p. 76-84.

1916*a* Helminthological Notes. Mem. Q'land Museum, 5, 1916, p. 186.

1916*b* Presidential Address. P.R.S., Q., 28, 1916, p. 1-30.

1916*c* The present paper.

T. H. JOHNSTON AND J. B. CLELAND. See also Cleland and Johnston.

1910*a* On the Anatomy and possible mode of transmission of *Filaria* (*Onchocerca*) *gibsoni*. P.R.S., N.S.W., 44, 1910, p. 171-189.

1910*b* The Hæmatozoa of Australian Fish No. 1. *Ibid.*, 44, 1910, p. 406-415.

1910*c* The Hæmatozoa of Australian Reptilia No. 1. P.L.S., N.S.W., 35, 1910, p. 677-685.

1911*a* The Hæmatozoa of Australian Reptilia No. 2. *Ibid*, 36, 1911, p. 479-491.

1912*a* The helminth parasites of man in Australia. Rep. Austr. Assoc. Adv. Sci., 13, 1911 (1912), p. 301-14.

T. H. JOHNSTON AND F. TIDSWELL. See Tidswell and Johnston.

S. J. JOHNSTON.

1913 On some Queensland Trematodes. Q.J.M.S., 59. 1913. p. 361-400.

F. HAMILTON KENNY.

1906 Five cases of Ankylostomiasis. A. Med. Gaz., 1906. p. 399-400.

G. KREFFT.

1871 On Australian Entozoa, etc. Tr. Ent. Soc., N.S.W., 2, 1871, p. 206-32.

R. T. LEIPER.

1908 (Identification of hookworms sent from Queensland by Dr. T. L. Bancroft). Brit. Med. Jour., Oct., 1908, p. 1354.

1911*a* Report on Onchocerciasis in cattle, etc. Rep. Local Govt. Board. Lond. (N.S.), No. 45, 1911, p. 6-16.

1911*b* Same as 1911*a*. Jour. Trop. Med. Hyg. Mar., 1911, p. 87-93. Abstract in Q'land Agr. Jour., Apr., 1911, p. 220-1. See also P. Zool. Soc , Lond., 1911, p. 45.

O. LINSTOW.

1888 Report on the Entozoa. Challenger Reports, Zool. 23, 1888, p. 1-18.

1898 Nemathelminthen, etc., in R. Semon's Zool. Forschungsr. in Australien, etc.. 5, 1898, p. 469-472.

1904 Neue Helminthen. C. Bakt. Orig., 37, 1904, p. 678-683.

1906 Gordiien und Mermithiden. etc. Mitt. Zool. Mus. Berlin, 3, (2), 1906, p. 243-8.

C. H. LAWES.

1895 Anæmia due to *Ank. duodenale*. A. Med. Gaz., 14, 1895, p. 445-8.

W. LOVE. See also Tyrie and Love.

1889 (Exhibit of *Filaria bancrofti*). A. Med. Gaz., 8. 1889, p. 135.

1895 (Note on Ankylostomes). A. Med. Gaz., 14, 1895, p. 456.

A. MACFADDEN.

1911 Report on meat inspection at English ports in regard to Onchocerciasis. Rep. Local Govt. Board, Lond., No. 45, 1911, p. 1-5.

MACDONALD.

1905 (Exhibit of filarial specimens). A. Med. Gaz., 1905, p. 334.

1908 Experiences of Ankylostomiasis in Australia. Lancet, 11 Jan., 1908, p. 102.

W. C. MACDONALD.

1911 Some remarks on sprue and Ankylostomiasis. A. Med. Gaz., 30, 1911, p. 368-72.

J. B. MACLEAN.

1908 (Discussion on Jackson, 1908). A. Med. Gaz., 1908, p. 370.

1909 (Note on percentage of filarial infections). A. Med. Gaz., 1909, p. 444.

1910 Filariasis. A. Med. Gaz , 1910, p. 234-5.

1911 Infective granuloma. A. Med. Gaz., 1911, p. 137-9.

J. Moore.

1914. Ann. Rep. Commissioner Publ. Health, Q'land.

A. McGown.

1915 In Ann. Rep. Dept. Agr. Q., 1914-5 (1915).

W. Nicoll.

1911 Onchocerciasis in cattle. Jour. Meat and Milk Hygiene, I, 1911, p. 71.

1914*a* The trematode parasites of North Queensland I., Parasitology, 6 (4). 1914, p. 331-350.

1914*b* The trematode parasites of North Queensland II., Parasites of Birds. Parasitology. 7 (2). 1914 pp. 105-126.

1914*c* On the migration of the larvæ of *Onchocerca gibsoni* through the capsule of the nodule. Ann. Trop. Med. Parasitology, 8, 1914. pp. 609-621.

1914*d* Remarks on the worm parasites of Tropical Queensland. Med. Journ. Australia. Sept. 12. 1914, p. 244-6.

✓ 1915 The trematode parasites of North Queensland III., Parasites of Fishes. Parasitology, 8 (1), pp. 22-40.

1915*b* Worm Nodules in calves—some negative observations and experiments. Med. Jour. Austr., 2, 1915, p. 529-31.

W. B. Nisbet.

1915 Note on the infectivity of Filaria. Med. Jour. Austr., 2, 1915, p. 449.

R. A. O'Brien.

1908 Notes from North Queensland. A. Med. Gaz., 1908, p. 121-4.

E. H. O'Doherty.

1898 Presidential Address. A. Med. Gaz., 17, 1898, p. 47-9.

A. Park. See also Barnard and Park.

1893 Parasitic diseases in the Colony of Queensland. Vet. Jour. Ann. Comp. Pathol., 37, 1893, p. 102-7.

1910 Reports summarised in Tryon, 1910*a*.

H. Plimmer.

1912 On certain blood parasites. Jour. Roy. Micr. Soc., 1912, p. 133-150

1915 Report on deaths in Zool. Gardens, together with a list of the blood parasites found during the year (1914). P.Z.S., Lond., 1915, p. 123-130.

C. J. Pound. See also P. Gordon and C. Pound.

1895 Redwater disease in cattle in the Gulf district. Govt. Printer, Brisbane.

1896 Reports in Rep. Intercol. Tick Conference. Govt. Printer, Sydney, Aug., 1896.

1897*a* Tick fever. Q'ld. Agr. Jour., 1, 1897, p. 258.

1897*b* Preventive inoculation for tick fever. Q.A.J., 1, 1897, p. 334-6.

1897*c* Notes on the inoculation of bulls against tick fever at Rathdowney and Rosedale. Q.A.J., 1, 1897, p. 473-7.

1898 Preventive inoculation of bulls for tick fever. Q.A.J., 2, 1898, p. 404-7.

1898-1915 In Ann. Rep. Dept. Agr. Stock, Q'land, 1898-1914 (1915).
1899*a* Tick fever. Agr. Gaz., N.S.W., 10, 1899, p. 64.
1899 Tick fever—Technique of the method of preventive inoculation. Q.A.J., 4, 1899, p. 58-65.
1907*a* Discovery of Trypanosoma in Brisbane rats. In Dr. Ham's Rep. on plague in Q'land, 1900-7 (1907), p. 160. Govt. Printer, Brisbane.
1907*b* Some investigations into Tick fever and means for its prevention. Q'ld. Agr. Jour., 18, 1907, p. 283-293.
1908 Tick fever in cattle—Technique, etc. Q.A.J., 20, 1908, p. 26-35.
1911 Evidence in R.S.C., 1911.

R.S.C.
1911 Rep. Select Committee on Mr. W. H. Ramm's claim to be the discoverer of the system of inoculating cattle with the blood of a recovered beast as a preventive or mitigation of tick fever. (Q'land Legisl. Assembly)—20th October, 1911., Govt. Printer, Brisbane. Evidence by Ramm, Pound, and others.

W. RAMM.
1911 Evidence in R.S.C., 1911.

S. J. RICHARDS.
1898 Tick fever. Q.A.J., 2, 1898, p. 221.

W. N. ROBERTSON.
1909 A. Med. Gaz., 1909, p. 391.

SIR T. ROBINSON.
1910 Rep. Agent General for Queensland for 1909 (1910). Govt. Printer, Brisbane.
1911 Ditto for 1910 (1911).

A. G. SALTER.
1908 (Discussion on Jackson, 1908).
1909 Ankylostomiasis amongst Queensland children. A. Med. Gaz., 1909, p. 352-6 and in Trans. Interc. Med. Congr. Austr., 1909, p. 423.
1911 (Remarks on Ankylostomiasis). A. Med. Jour., 1911, p. 522.

SAWKINS.
1903 (A Note on a case of *Filaria nocturna*). A. Med. Gaz., 1903, p. 214.

G. SWEET. See also Gilruth and Sweet; Gilruth, Sweet and Dodd.
1908 The endoparasites of Australian stock and native fauna, 1. Census. P.R.S., Vic., 21, 1908 (1909), p. 454-502.
1910 Some new and unrecorded parasites from Australian chickens. P.R.S., Vic., 23, 1910, p. 242-256.

GREIG SMITH.
1899 The tick fever parasite. P.L.S., N.S.W., 1899, p. 585-95.

S. G. THORN.
1912 In Ann. Rep. Dept. Agr., Q'land, 1911-12 (1912).

F. Tidswell.

1899*a* Protective inoculation against tick fever. Agr. Gaz., N.S.W., 10, 1899, p. 469—also publ. by Govt. Printer, Sydney, 1899.

1899*b* Some further observations on protective inoculation against tick fever. Agr. Gaz., N.S.W., 10, 1899, p. 741.

1900 Second report on protective inoculation against tick fever. Govt. Printer, Sydney, 1900—summarised under "Tick fever" in Agr. Gaz., N.S.W. 11, 1900 p. 516.

F. Tidswell and T. H. Johnston.

1912 Introductory remarks concerning some modes of dispersal of helminths. Rep. Bur. Microbiol., N.S.W., 2, 1910-11 (1912), p. 112-3.

H. Tryon.

1907-1915 Rep. Govt. Entomologist—in Ann. Rep. Dept. Agr. Q'land., 1907, 1908, 1910, 1911, 1912, 1914, 1915.

1910*a* Verminous tumours in cattle—Australian literature. Q'ld. Agr. Jour., 1910, p. 81-4.

1910*b* Ditto in Jour. Trop. Vet. Sci., 5, 1910, p. 511-6.

1911*a* Verminous tumours of cattle. Rep. Dept. Agr. Q'ld 1911, p. 73.

G. Tucker.

1912-4 In Rep. Dept. Agr. Q'ld., 1912, 1913, 1914.

A. J. Turner. See also Gibson and A. Turner.

1890 On disease among children in Brisbane. A.M.G., 1890, p. 65-70.

1895 (Exhibit of Ankylostomes). A.M.G., 1895, p. 456.

1895 A parasitic scourge of warm climates. Trans. Int. Med. Congr., Austr., 4, 1896, p. 101-4.

1896 The treatment of Ankylostomiasis. P.R.S., Q., 11, 1895, p. 99-102.

1896 (Discussion on Ashworth, 1896). A.M.G., 1896, p. 484.

1909 The prevention of parasitic anæmia. A.M.G., 28, 1909, p. 350-2.

B. Tyrie and W. Love.

1906 (Exhibit). A.M.G., 25, 1906, p. 408.

R. Wallace.

1908 Tick, redwater or Texas fever in cattle. Q.A.J., 20, 1908, p. 314-327.

E. R. Wynne.

1896 Report on investigations at Hughenden on Texas or tick fever. July to Oct., 1896. Govt. Printer, Brisbane, 1896.

F. Zschokke.

1896 Die Tænien der aplacentalen Saugethiere Vorl. Mitt. Zool. Anz., 19, 1896, p. 481-2.

1898*a* Weitere untersuchungen an Cestoden aplacentaler Saugethiere. Zool. Anz., 21, 1898, p. 477-9.

1898*b* Die Cestoden der Marsupialia und Monotremata in R. Semon's Zool. Forschungsreisen, etc., 5, 1898, p. 357-80.

1899*a* Entozoen der aplacentalen Saugethiere. Proc. Internat. Congr. Zool., Cambridge, 1898, p. 203-4.

1899*b* Neue studien an Cestoden aplacentaler Saugthiere Z. f. Wiss., Zool., 1898-9, p. 404-445.